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No. 2354.—Vol. L.

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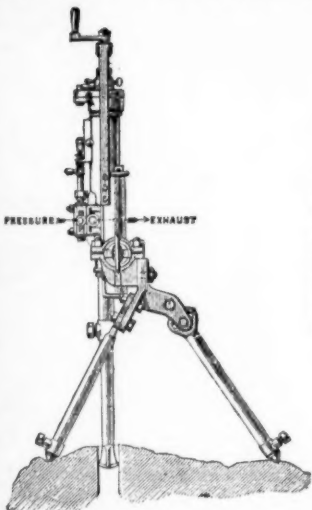
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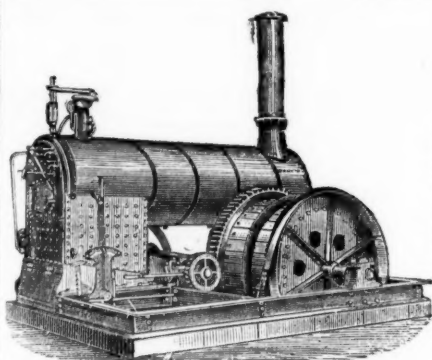
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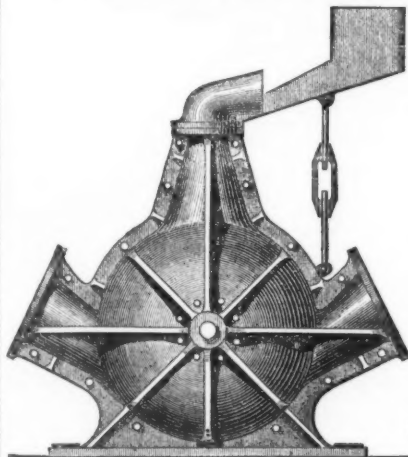
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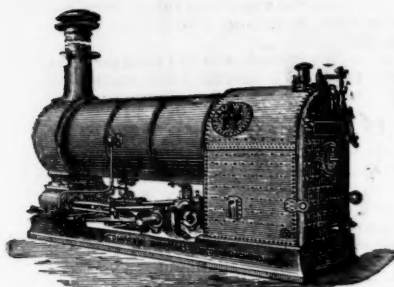
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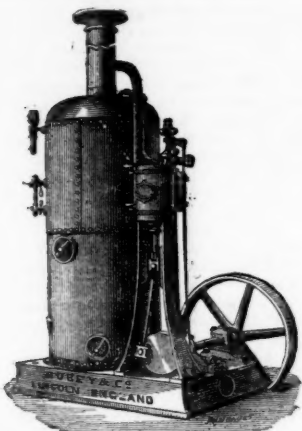
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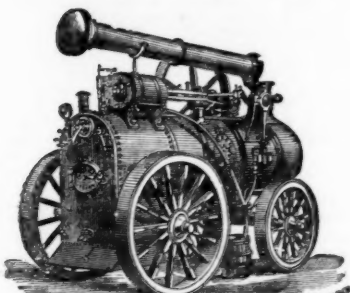
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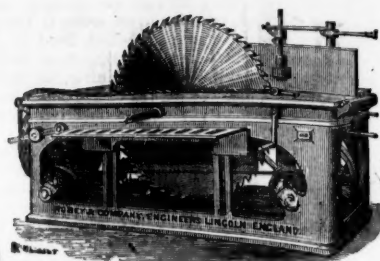
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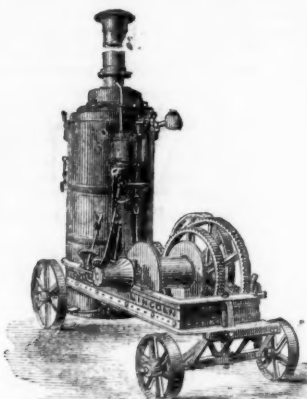
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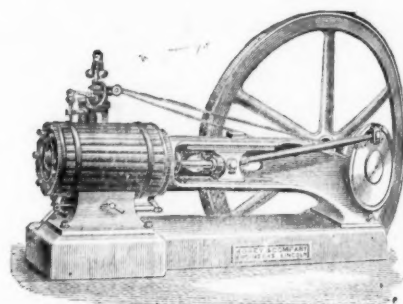
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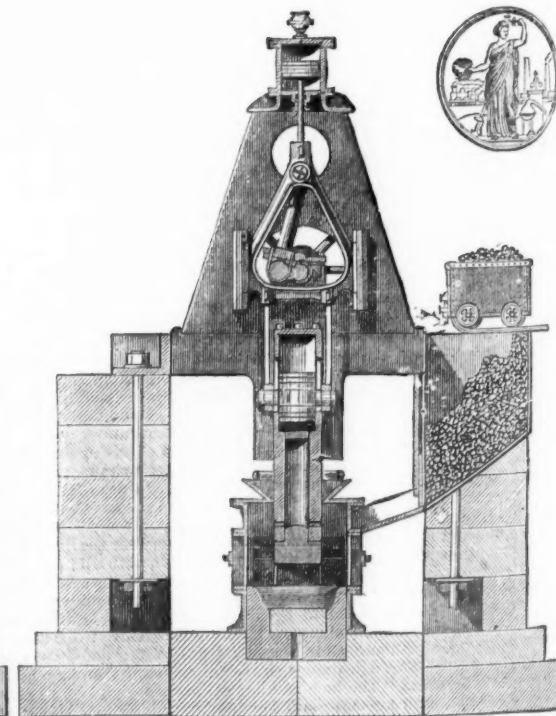
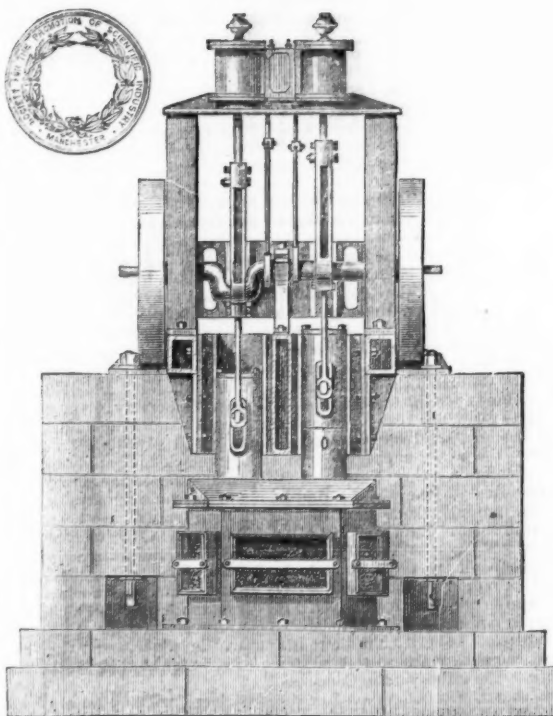
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Original Correspondence.

PREVENTION OF COLLIERY EXPLOSIONS.

SIR.—The object of your correspondent, Mr. W. T. Mulvany, is a very proper and praiseworthy one, and I, for one, quite agree that the mining engineers of Great Britain in private practice, as well as those in her Majesty's service as Inspectors of Mines, might with advantage visit foreign mining districts periodically, and also the various districts of England, in order to see what is being done in each, and to ascertain the circumstances which lead to the adoption of the various systems or methods of working coal in them. It should be understood by the public that in mining, as in every other profession, the system applicable in one case is not invariably applicable to others, and local circumstances have largely to be considered in deciding upon a system of work.

My object in writing this letter is to point out that erroneous impressions are liable to result from Mr. Mulvany's letter where the readers are not sufficiently acquainted with the subject. In the first place, it might be thought that the mining engineers of Great Britain were unacquainted with the principle of ascensional ventilation, and that it was something new. Now, Sir, our mining engineers were well acquainted with this subject when Mr. Mulvany was acting as a Commissioner of Drainage, and many years before he knew what a coal mine was like, also that for half a century, more or less, it has been compulsory in Belgium, France, and Germany.

Mr. Mulvany might, when writing, have mentioned—as he must be well aware of the fact—that the circumstances of the German coal fields are very different to those of Great Britain.

1.—The measures lie very steep, as a rule, and the driving of the stone drifts he refers to is almost as much a necessity as the sinking of shafts.

2.—The Germans, as a rule, have a considerable number of seams at work at the same time, thus distributing the workpeople amongst totally separate districts, which, unless with bad management—not too uncommon there, either—are kept distinct as regards ventilation, and cannot very well be affected by accidents in the others.

3.—The depths attained from the outcrops of the coal measures have not yet been very great, and comparatively mining on a large scale has only recently been commenced.

4.—The coal and coal measures of Germany so far exploited have not been found to be of anything like so fiery a nature as some of the fiery collieries of Great Britain, in which latter more gas issues in a day than, probably, is the case in the most fiery German mines in a week—yes, in a month I might almost say.

5.—The output of coal in Germany is only about one-third or one-fourth of that of Great Britain, &c.

There are many other matters which, if time and space admitted of, might be set forth to show the difference between the countries.

For the most part in Great Britain the coal seams lie flat, or with only moderate gradients, which preclude the driving of "Welter Stille" drifts, with which even explosions do occur in Germany. The writer is able to recollect cases in which 120 lives, and smaller numbers, have been claimed as victims to the effects of explosions of gas in German mines, and one has this week been reported from Westphalia, where 11 lives were lost and 11 persons seriously injured. Further, upon examining statistics it will be found that in Great Britain as large, or a larger, quantity of coal is obtained per life lost in England as is the case in Germany, which, after all, is the proper way of comparing the relative fatalities.

In closing this long letter, I wish it to be perfectly understood that my object is not to prevent measures being taken with a view of obtaining information which may lead to further saving of life, but to set the public right as to their information where comparisons are made. The thanks of the mining engineers of Great Britain generally are due to Mr. Mulvany for his promised assistance and cordial reception in case of a Commission being sent over as he suggests.

MINING ENGINEER.

RUSSIAN COAL FIELDS—IRON—No. III.

SIR.—Iron smelting and manufacturing in Russia is slowly but steadily increasing in dimensions, and offers a splendid field for English enterprise, especially now since the Customs tariff has been augmented in favour of that country, so that even under the most unfavourable circumstances of inferior management, whether native or foreign, want of experience, and increase in cost of fuel (where that is charcoal) that may exist in some instances, a good profit can be realised in the interior of the country. How much more, then, when good intelligent management, experience, and cheap fuel are brought to bear upon the question. Even at the ruinously low price of pig-iron in this country they cannot yet compete with England in the sale of common pig-iron in St. Petersburg. But in quality with price they can successfully compete, for no country can surpass them in all the better descriptions of raw and manufactured. At one works I know they can draw from their iron wire of such fineness that a peruke has been made of it, and not discernible from human hair. So much for the quality of iron. Russian sheet is famed for its purity, ductility, and face, and which after planishing can be exposed upon the roof of a house for a long time, sometimes two years, unpainted without oxidising; but however much the Russian iron trade may develop during the next series of years (as it will), it will be impossible for it to become an exporting country for this article, as its own requirements are and will be enormous, and as trade develops in the country so will the demand increase.

The iron and coal trade of Great Britain will never be what it has been. She is now reaping either the punishment or reward, which ever the various sections of people like to call it, of the striking system and Trades Union movement. One thing is quite certain that the British workman has been doing his utmost to drive all the manufacturing trade from this country, which trade is being steadily and surely absorbed by each of the various civilised countries. Some say that this state of things would have come under any circumstances, whether or not the British workman will have the distinction of having prematurely hastened the present position of matters in Great Britain.

Foreign countries who used to be our largest customers, and whose commerce and internal affairs were obliged to run their usual course, could not afford to stand idly by while the British workman waged his moral civil war; and this very episode in English history set the people of those countries thinking that it was quite possible with all their natural resources which had lain to a great extent in a state of quiescence till then, by dint of a little exertion on their part, and expenditure of the very capital they had been accustomed to pour into Great Britain, for them to develop such resources greatly to their own advantage. Unfortunately for England third parties can often estimate the true merits of a dispute with greater accuracy than those immediately interested. The fact is other countries weighed Great Britain in a manufacturing sense, and found her wanting. All their old confidence in her sons of toil was shaken from that moment, as no one could be certain when or when not it might please them to strike again. Such being the case they dare not jeopardise their business by placing their orders in England. These remarks have been made to me over and over again by various railway directors and manufacturers and merchants in Germany, Austria, and Russia, so that instead of abating the development of their several countries it incited them to renewed efforts to place themselves beyond dependence upon us. America has instituted an almost prohibitory tariff, Germany, Austria, and Russia also, for the purpose of stimulating home enterprise. These facts cannot be gainsaid. This being the case it is clear that intending capitalists for iron enterprise must look for other fields. It is useless to think of any of the Western European countries, and the only solid one, with all the requisites for successful operations, is Russia. She has a large increasing internal market for her railways, telegraphs, ships, locomotives, &c., and for her various and increasing manufacture of machinery, which will gradually absorb all she can produce for many years to come, so that if the trade is handled with firmness, courage, and intelligence (such as that which brought England to its prominence as the great iron producer) it is the finest country in the world without exception for the capitalist endowed with the above qualifications.

My great object in laying so much stress on this part of my subject

is that while America, Germany, and France are securing some of the best properties, I regret to see my countrymen who are not generally behind in such enterprises, standing aloof through erroneous political views and wrongly biased information regarding the people and the Government of the country. Russia presents an unlimited field for profitable employment of British capital, and I would urge that the opportunities now offered for investment should not be allowed to pass. The title to land purchased is made absolutely valid, indisputable, and clear. A first act or contract has to be signed on payment of a deposit before a notary public either in St. Petersburg or Moscow, and can be legalised by the Consul of whichever country the purchaser is a native of. The second act is the conveyance, when the whole of the purchase money has to be paid, which must be done on the property itself before the notary of the district in which it is situated, and in whose notarial book of estates the property in question is registered. Should there be any outstanding debt upon the property the notary has no power to sign the conveyance or transfer until such debt has been satisfied to the satisfaction of the creditor entered in the book. That being done he is able to give the purchaser a clean and clear title. At the expiration of a month afterwards the purchaser has a right to inform the judge of the district of his having become the purchaser of such estate, whereupon the judge calls a kind of installing court, composed of the proprietors of the land surrounding the newly-purchased property or their representatives to meet at the Town Hall, when he declares to them that such a property has been sold to such a party, and at the same time introducing him; thus his title has become indisputable.

Referring to my letter on Russian Coal Fields in the Journal of Sept. 18, I spoke of an iron property (in the neighbourhood of the colliery I there described) which is of considerable extent, and adjoining it, on which land there are large deposits of rich iron ore which have been proved by the Government geologists and mineralogists of known repute as independent authorities of reference, besides technical engineers' researches (so that the colliery and iron property, taken together, would form a splendid enterprise. Of course, it is of no use taking the iron without the coal, although the latter possesses immense value singly). It being all pasture land it would be needless to purchase it. A lease, however, can be obtained for 21 years on a certain royalty, with a dead rent to commence after a certain date, allowing sufficient time to open the iron mines, such dead rent to merge into royalty, together with a certain fixed price for purchase or rental for surface spoil ground on which the shafts would be sunk, the tailings or rubbish tipped, engine-house, offices, and cottages erected. This lease may be obtained on very advantageous terms. The blast furnaces and rolling mills should be erected close to the colliery on the freehold land. The market for this iron would be all the south—that is, to Koston on the Don, south-eastern and eastern cities and towns, and the Caspian ports via the newly-opened Donetz Railway, which terminates at Tsaritzin, for Astrachan (on the banks of the Volga) and the Caspian Sea. I propose to continue the subject in my next letter.—London, Sept. 29. VERITAS.

MINERS' WORK—AMERICA v. CORNWALL—No. I.

SIR.—Having passed nearly six years of my life in America, and the greater part of that time on the Comstock, in Nevada, I read with considerable interest the remarks made by Mr. John Rule at the West Seton meeting some time since, and also a letter by "A Lover of Truth." Both of them seem to be something like the men in the tale of the "Chameleon," only a little more so. In that tale they simply argued facts as noted by themselves. Mr. J. Rule and "A Lover of Truth" simply argue facts without any explanation or modification, so as to make them suitable to their own designs. Each, undoubtedly, has some object in view, from the manner in which they make their statements. The greatest truths may be told in such a manner as to appear to be the greatest lies to those not knowing the whole of the circumstances relating thereto.

Having been brought up as a Cornish miner myself, having, as I have, held the position of mine agent there, and having worked as a miner, and held the position of foreman or "boss" in the Comstock Mines, and having also had the management of mines in other parts of the world, you might naturally suppose I have not been indifferent on the above subject, and that I had formed some opinion on the working of miners in Cornwall compared to the working of miners in other parts of the world. Mr. Rule used an expression which, I have no doubt, has been made by many; I know I have used it myself many times—"Some years ago I went to Nevada, and if any fellow wants to know what work is there is the place to go." I can fully endorse that statement, and I know that many a man on first starting to work in Nevada has wished himself back in Cornwall again, working for 50s. or 3l. per month; but "necessity has no choice," so he is obliged to put up with it, although he vows in his own mind that as soon as he has the means he would return home again—and many have done so—but having realised his gettings after a pay or two, and had used himself to the hard work he had to perform, then he thinks that he would like to stay a month or two more, so that he might have a pound or two in his pocket when he did arrive home. So he goes on, until after awhile he begins to think he works no harder there than he did at home; and, undoubtedly, "A Lover of Truth" has found himself in this position, notwithstanding his statements to the contrary. As to working on Sundays, on the Comstock there are certain causes, which I need not mention now, that almost compel the work to be carried on every day alike. Whatever the object of the owners may be in compelling the miners to work on Sundays, they know before they go to work there what they have to do; and, having imposed on themselves this task, they ought not to grumble about it—at any rate, they get the extra pay—no five-weeks month for the same pay as four-weeks month there; and everyone who finds himself there should make best of a good bargain, and think like the Cornish local preacher who, finding himself compelled to work on Sundays whilst there, remarked that "4l. per day is better than going to chapel in such a place as this, and the more Sundays I work the sooner I shall be able to get out of it." Mr. Rule's remarks about the water supply do not, to my knowledge, apply to any mining camp in either Nevada or California, except they might on the first rush to the place. Had he made the same remarks of some of the mining camps in Chili or Peru there might have been some truth in them. Rain does not often fall in Nevada, but neither Mr. Rule or "A Lover of Truth" says anything about the water supply in the shape of snow. A good deal of that falls in and around the Comstock region in winter, and I have myself seen several inches of snow even in the month of June. It is true, though, for all that that water is not so abundant in that region as it is in some other places; but this I believe, that there is not another place under the sun where the miners are so well supplied with water at their work as they are in the mines on the Comstock.

I think that the terms "slave" or "slave driver" are very improperly applied to workmen or bosses in that district; men have to work hard there it is true, and bosses are there to see that the work is done. "Keep that hammer going!" is sometimes heard there, although "A Lover of Truth" puts it down to be a lie, but as he says it may be, it is only to those who shirk their honest duty, but, as a rule, the shirker is politely told to "go on top" and rest him, where the air is purer—i.e., he is discharged. "A Lover of Truth" asks the reason why so many Cornish miners go to Nevada? but he has not stuck to the truth in his answer. The first and foremost reason why so many Cornish miners go to Nevada is that there is not employment at home so that they can live there, and in consequence flock to the greatest attraction in the shape of high wages, or where they have friends who can pay their passage-money for them; not, as he asserts, on account of the easy work and fair treatment they meet with there. If he thinks it is an easy place to work in he must be a highly favoured one, and has altogether forgotten his first experiences in Nevada, and if he receives fair treatment it must be in consequence of being that favoured one, and he thinks the same is in store for everybody. Part of the time I was in Nevada I was a favoured one myself, and got my \$6 and \$8 a-day for a little work, nevertheless I had to do my duty to the letter; but as there are exceptions to all rules so there are exceptions there, but they are very few indeed, and it does not make Nevada an easy place to work in, and you get considerable and fair treatment as long as you can do your day's work,

but when you fail in that you are shirking, and consequently sent on top. "A Lover of Truth" is the first I have ever known to make such an assertion as that, had such have been the case I should undoubtedly have spent the greater part of the last 10 or 12 years there, in addition to what I spent there prior to that time. The high wages ruling there is not in consequence of the demand exceeding the supply of miners, because there has been several attempts to lower wages there, when the Miners' Union have stepped in, and by force of arms compelled the owners to pay the wages now ruling there, but there never was any agitation there to do away with Sunday labour, as far as my knowledge extends.

I think this letter will now be long enough, and as I shall not have time to finish the subject for this week's Journal I will continue it in a future communication. A CORNISHMAN.

MINING IN ALGERIA—No. I.

NOTES OF A JOURNEY THROUGH THE NEW MINING DISTRICT BETWEEN DJIDJELLI AND BOGIE, AND CROSSING THE DJIBEL HADID MOUNTAINS.

SIR.—I send you a copy of my Notes, which I think may be interesting to some of your readers:—

After receiving my instructions I slept at the Bristol Railway Hotel, and the next morning early chased the boots and my luggage to the train, finding myself at night at the Hotel du Louvre, in Paris, and the next day on my way, via Marseilles, to Algiers (or Alger), by the Imperial boat, at which place I arrived on April 20, much to my friend's delight, who was very sea-sick all the way.

On April 25, after passing a most uncomfortable time in a dirty French steamer—full of Arabs, wood-cutters, and Spaniards—we were landed at the clean little town of Djidjelli, with its straight rows of streets and whitewashed houses, planted on either side with that quick growing tree, the eucalyptus, so successfully introduced into the country by the French. On the 27th we started on mules to view a coal deposit at Beni Siat (the name of the tribe and country), and the name of the chief or Khedive is Benamoukran. This deposit is of no value, although it is thought much of by the natives, the coal being used by the blacksmith—a Frenchman, called "Chartron"—in Djidjelli for forging purposes, &c. The formation around here is all jumbled up together, a sort of sandstone, soft blue clay-slate, and some Cornish ground with a small lode of manganese and one of copper. The appearance of the country is very like Estramadura, in Spain, covered with brushwood, cork, and oak. The French have made a new road to the sea; some of the land is rich, and the wheat, now in ear, looking splendid. The Arabs are now sowing canary seed, or, as they call it, Alpist. The cattle look well, but are small. I saw a snake 3 ft. long, and several eagles, and three monkeys wild in the wood, but could not get a shot.

April 28.—After a lot of trouble and great talking my interpreter, Amet Ben Goula, secured for us 12 mules and four Arab drivers, with tents, beds, cooking utensils, &c., to take us over the Djibell Mountains to Bogie, a distance of about 90 miles. These mules can always work day after day for seven hours; a fair load for a mule to carry is 100 kilos, or 2 cwt. of 112 lbs. each; an hour for a mule is 5 kilometres, or regularly 3 miles. Two men can drive 20 mules, but on a good road more. The Arab wages is from 2 fr. to 5 fr. a day according to the man's value. The ordinary value of a mule is 12l., but I can buy the 12 mules we are driving for 3000 fr. The Arabs wear boots costing 7 fr. each; mules eat 6 kilos. of forage-bay and 5 litres barley a day; 5 litres of barley costs in a bad year 5 fr., and dry hay 5 fr. per 100 kilos. At 8 A.M. we started for Garouche, in the Beni Fourhal country. This is where the Talabor Company work the forest cork, and export timber to France, principally sleepers for railroads. The company have made a good road to the port of Taza. Garouche is a sort of platform in the centre of the woods, with rushing small streams running down through it, and consists of small huts, log house, and savage dogs. The road now takes us through the woods to Beni Fourhal tribe, and the name of the Khedive is Amar Ben Habiles. At night the Khedive, who is very civil, sends us a carpet, and we go into a miserable reception hut, our Arab drivers, &c., all sleeping on straw. A very nice fellow, Amar Ben Berkhasen, attends to me most kindly. I cannot sleep, the frogs make such a noise in the river; and the fleas—oh! awful.

April 29.—We saw Arabs carrying a pole with a flag and figure, singing and praying for rain; they visit the different huts, called Goubri. They call this prayers to God and Mahomet. The name of this place is Ouled Saad. Very good land here, and good hedges for the country; splendid grass for hay. Irrigation is wanted, although it is now done with small gutters. Lovely country; white thorn, broom, blue violets, pansies, and large quantities of long grass on the hill-sides called Dias, suitable for paper making. The wild rhododendron is splendid, as also the numerous ferns. Bee-hives all along the road. The formation of the country along here is dark sandstone, shale, limestone, red sandstone, new and old conglomerate, iron, quartz, and some Cornish ground. The look of the country is very like the Cumberland or Lake districts, and some valleys like Devon and Cornwall. We pass through dense forests of oak, cork, ash, fir, broom, rhododendron, ferns, and beautiful vegetation. We are now 2000 ft. above the sea. The men and boys are singing in the fields with their cattle. We pass the Roman fort and River Gingen. We see quantities of small fish.

April 30.—We arrive at the Khedive Kaed Boarour (tribe, Beni Marmi) 5 P.M., after a very tiring day. Looking forward to seeing the mines to-morrow. R. G. S.

PITANGUI GOLD MINE, BRAZIL.

SIR.—It will be seen that this successful undertaking has at last commenced to reward its anxious shareholders, as will be seen by the first dividend being declared at the rate of 20 per cent. per annum; but we must not stop here, as there is every prospect of this little mine paying back, at no remote time, all its original capital. Ever since—a few months back—the unwatering of the mine it has made regular monthly profits, ranging from 2000l. to 5000l. On the first returns of gold it was not expected to give (without any stamping machinery) the miraculous profit of 2500l. every month: but in a very short time, and when the stamps are erected (which are now in course), we may expect substantial profits, to enable the directors to pay back, with a few dividends, cent. per cent. I presume the directors could have declared a much higher dividend, but (unlike some of our Cornish mines) thought it advisable not to drain the account quite dry.

Very little has been done in the main great output, the Ouro Podre vein, but the returns obtained elsewhere, so by this it will be seen that they do not depend solely on the Ouro Podre vein, and I have heard from good authority that there are no less than 60 such veins more or less productive, and which will, it is anticipated, when developed prove equally as productive as to the Ouro Podre. It is said that the Bahu veins are not far distant, and that they were left by the natives very rich, therefore we look forward to the intersection of these veins with no small amount of anxiety. I am glad to see, by the latest advices from the manager, that every progress is being made in this section, and he says, "the Jacotinga had become most favourable for driving, and should the ground continue so, he expects to reach the Bahu veins in about six weeks."

The last report shows that the building of the stamping mill was progressing satisfactorily. The produce for the first half of August amounted to 1093 oits. of gold, of which 390 oits. were obtained from 124 tons of ordinary mineral, and the remaining 703 oits. from only 14 cwt. of vein stuff; thus, the average of the ordinary mineral was 3 oits. per ton, while the vein stuff averaged 1004 oits. per ton, equivalent to 26l. 14s. The produce for August was 2891 oits., and the profit amounted to 560l.

The directors deserve the greatest praise, as this mine's great success is due to the business and miner-like manner in which it has been carried on, although a London office of reference would benefit one and all, and be of great advantage to intending investors and shareholders in London. Pitangui for some little time will be in its infancy, and when the stamps and all necessary machinery are erected, the mine fully developed, and the remarkably cheap way in which the returns can be made, together with the small cost, we will leave the mine to speak for itself.

The shareholders have been warned through your valuable Journal

about parting with their holdings; the shares must go very much higher, but it would simply be ridiculous to notice the market price and fluctuations, as in Pitangui they must look forward to a lasting dividend-paying investment. I warn the shareholders not to notice any rumours on the market fluctuations, but to hold on, and they will be bountifully rewarded for their patience, remembering "the world was not made in a day."—*London, Sept. 29.* INVESTMENT.

MINING IN NEW SOUTH WALES.

SIR.—The following extract from to-day's Sydney Morning Herald speaks volumes for the wealth, now first begun to be developed, of our iron ores, as although the company began operations with a most inadequate capital, still by strict economy it has slowly sailed into success. The works are situated in the mountains, about 80 miles from Sydney, and adjoin the Great Western Railway, the easiness of access to which, in fact, was the reason why the mine was opened there instead of about four miles back, where the coal and iron overlies each other in the sides of the hills; two kinds of coal and three or four varieties of iron ores, all of the best description, are said by our geologists and miners here to be one of the most perfect and easiest worked iron mines in the world; but as it will cost a few thousand pounds (say 6000*l.*) to connect it with the main railway line it lies idle!

LITHGOW, Thursday.—The manager of the Lithgow Ironworks reports that the whole of the rails for the Randwick Tramway have been finished and passed, and 39 tons were sent down to-day.

Of course this is only an instalment, as the colony will want at least 100,000 tons of rails for the present authorised railway extension; and if mines of our own working can supply as good an article as the English do, at the same price even, the colonial maker will be sure to get the preference, and there probably never was a time so favourable for the investment of capital in iron mining here as now, to anyone starting with sufficient capital to be free of the banks, and who understands his business fully.

Kerosene shale is also coming to the front with us, and the demand for the Joadja Creek Company's shale is yearly increasing, especially for England and our sister colonies. There are but two companies at work here at present—the Hartley (Western Line) and the Joadja Creek (Southern Line). Both of them distil oil, which has a large sale here, and also export the crude shale (for gas making) to California, Europe, China and India, and the colonies. A fine seam has just been discovered, and of course carefully covered up again, for which the fortunate finder asks 10,000*l.* for his information only! As it is Crown land, open to be taken up by anyone, and if it is really as good as the sample it is probably worth that money even.

Referring again to iron, whilst boring with the diamond-drill in Sydney, a solid belt of ironstone of over 40 ft. thick, and several smaller ones—in all, nearly 200 ft.—was passed through, said to be about 40 per cent., and as small coal for smelting can be got for about 8*s.* a ton, possibly some day we "Sleepy Hollow" people may try to utilise it. Three separate bores have gone through it, proving several thousands of acres to contain it; the thinnest section was 140 ft. and the thickest about 260 ft. through.

Tin: This also is improving, several rich finds having lately been made, miles apart from each other, in the New England district, mostly at about 80 to 150 ft., good sinking, and in most cases on abandoned mines—i.e., blocks taken up during our mining mania of 1872, the surface fossicked over, the creeks gutted out, and then no capital being left, nor any faith either, being left to revert to the Crown. One English venture—the Planet Tin Mining Company—is also a notable instance; the proprietors there really had capital, but lost heart, and left off work just when they ought to have gone on, and now there are scores of working miners making a handsome thing out of the "abandoned property," whilst the fact of the lodes also being in the ground is proved now beyond doubt.

Silver: At Boorook (far north of Sydney) Horton and others are doing very well, although their appliances are not the most scientific, but the deeper they sink the more prominent appears the lode, or rather lodes, and as there is also a fair percentage of gold in it the profits are very large. About 100 miles to the south of Sydney is another silver mine—an abandoned one in this case; it was started about 20 years ago, with a great flourish of trumpets. We were nearly as ignorant of mining and minerals then as we are now, and the slabs of arsenical pyrites were shown in perfect good faith as silver! An expensive plant was put up, the wrong sort, of course, for the purpose; a splendid shaft sunk, not 500 ft., as it should have been, but about 150 ft.; 20,000*l.* spent in promotion, bonus works, working, &c.; 500 tons ore brought to grass, the lode actually getting more solid and better in the bottom of the shaft and drives, and then a collapse. About 100 tons sent to England only left a small profit, and so the company dissolved, left its property to the winds and weather, and finally sold the plant for less than the price of old iron. Lately the Government Geologist here inspected the property, and I was told, I do not know of my own knowledge, that out of 20 assays the lowest was $\frac{1}{2}$ oz. of gold and several ounces of silver, and there were some others of several ounces of gold and a very large percentage of silver per ton; whilst for the stuff at grass, after lying there all these years, picked and re-picked—in the first case by the company, and afterwards by visitors, &c.—he estimated the value now at 8000*l.* And yet with this undoubtedly honest and scientific report staring us Sydneyites in the face, for the report is on record in the Government Mining Department, the property is as likely as not to be idle for another 20 years before we shall subscribe the few thousands necessary for furnaces and other proper plant according to the more scientific system of the day.

Bismuth: A 2 ft. lode of this was discovered last week by a gentleman looking for antimony; it was in an abandoned shaft, out of which a few tons had been raised by a neighbouring farmer 12 years ago, who not finding any gold in it dropped it—of course.

Cobalt, also, has been found in new districts to where it was known to previously exist.

Chrome Ore: Although this is not worked by us in New South Wales, still it may interest your readers to know that large deposits have been found in New Zealand and New Caledonia; and a new English firm lately started here—D. Storer and Sons—having the enterprise we colonists so lack in mining affairs, have chartered a vessel for a full cargo of it from Noumea back to Sydney, whilst I understand that Mr. Hackett, the gentleman in New Zealand who is arranging for dealing with it there, will probably ship direct to England.

Gold: Nothing specially stirring as yet. The best worked company here—the Star of Peace, at Hill End—is still steadily opening up the mine in preference to quitting it for every patch of gold, as is the rule here; and it is generally believed by the more experienced miners that at a depth rich deposits will come in again, and if they are not half or two-thirds gold (as was literally the case at the 150 ft. levels) they will pay well, owing to the first-class way the whole property is arranged, both as to economy in working and extent of area. I mention this mine specially, because it is the only one in the colony which has been continuously worked on a sound business principle and by a first-class business man, who has such faith in it that he has not only invested his whole fortune in it but now resides on the spot and sees to everything personally, for as large dividends were paid during the "rich days" very little capital was left for the poorer ones, and so every penny is jealously looked after by the few remaining shareholders. Should he succeed in picking up the rich leads again it will give such an impetus to real mining here as we have never even dreamed of; as hitherto, despite the fuller experience of Victoria, every mine nearly has been abandoned as soon as the first shoot of gold was worked out or lost.

Sydney, New South Wales, August. R. D. ADAMS.

GREAT COBAR COPPER COMPANY.—The mining manager reports for four weeks ending June 26:—In the Underground Workings: The end being driven south from Barton's shaft at the 29 fm level has been extended 10 ft. This end is altogether in the lode, and the lode will yield at this place 8 tons of 12 per cent. ore to the fathom. The end being driven south from Renwick's shaft at the 26 fm. level has been extended 33 ft., there is a trace of copper in this end, and the indications are favourable. The small shaft being sunk 100 ft. north of Barton's shaft has been sunk 14 ft., and is now down 143 ft. (leaving about 12 ft. more to be sunk to hole through to the 26 fm. level). This shaft is altogether in the lode, which will yield 10 tons of 18 per cent. ore to the fathom. The result of the past four weeks work at the 54 fm. level, Barton's shaft, has proved the lode to be 43 ft. wide without cutting the eastern wall, the character and quality of the lode continuing about the same. About 1600 tons of 14 per cent. ore have

been raised from the different stops, and the prospects of the stopes generally show favourably for the future.—At Grass: Good progress has been made in axing required appliances in the workshops, making dressing floors, tramways, and erecting additional brick sheds. At the smelting works the product of 1490 tons of ore smelted is equal to 203 tons of fine copper, and 205 tons of copper have been refined and 210 tons of copper dispatched. During the past 24 weeks 8334 tons of ore have been smelted, yielding about 1180 tons of copper; 1181 tons of copper have been refined, 1419 tons of copper dispatched. The work of building Nos. 12, 13, and 14 furnaces have been pushed on with all speed, and No. 12 furnace will be completed in about a week from date. A shed has been erected over Nos. 11 and 12 furnaces. I have now at work eight furnaces treating ore, two furnaces roasting regulus, and the refinery and everything throughout the mine is going on satisfactorily.

GOLD MINING IN THE DUTCH WEST INDIES.

SIR.—When a person treating an important question in the papers dares to do so with open face and under his own name, he is entitled to expect that those who differ with him in opinion and want to contradict his assertions should likewise use their name and thus fight a fair battle. He is undoubtedly entitled to expect this when in answer to facts stated by him, and the truth of which can be easily proved, he is made the object of such scurrilous attacks like "A Late Resident in the Colony" thought fit to fulminate against me. Although it is not difficult for any one to see through the mask, and recognise in our "anonymous" a salaried agent, an employee, or a director *pro tem.* of the Aruba Companies, I do not intend to follow his example by filling this letter by diatribes against him, for that would be committing a similar offence and violating the integrity of your long-established Journal, but I do intend to continue barking like a watchful dog against approaching enemies whose only object is to attack the purses of the credulous public.

Notwithstanding the very favourable report of Messrs John Taylor and Sons, it is a fact that since the Gold Mining Company has taken over the Aruba Mines they have proved a failure, just as they proved to be a failure when they were owned by former parties. I have no desire to take away a particle of the well deserved reputation of the eminent firm of Messrs. Taylor, but *errare humanum est*, just as many others, they are not infallible, and I am sure if duly investigated it will be proved that Aruba is not the only instance where reports on gold mines made by the most renowned miners have not been verified by the results obtained. Had their report been confirmed then the Aruba Gold Mining Company should have long since paid dividends instead of making these continuous applications on the shareholders and to the public.

It is very easy to say that the failure is due to the scarcity of labour from which the Gold Mining Company suffered, but anyone acquainted with Aruba knows better, and is able to prove the contrary. Aruba is a very poor place; during several years the inhabitants had for a great part to be maintained by public charity from the neighbouring islands, from the Mother Country, and even from Venezuela. Any labourer would have considered himself happy to have obtained employment, but then they had only one condition, they wanted good pay, not high wages, to be paid in cash and in due time; and I dare to repeat that had the Gold Mining Company put this method in practice it would not have encountered any difficulty in obtaining sufficient labourers on the island, in the same manner as on the other islands, where there were always sufficient hands for enterprises which employed four or five times the number of men the Gold Mining Company required. Besides, did it take the company eight years to discover the scarcity of labour, or had those eight years to be employed in diplomatic negotiations at the Hague to get the relaxation of the restriction? In regard to my remarks on the phosphate of lime question, "A Late Resident in the Colony" most ably turns round it without in any way denying the exactness of my assertions, but at the same time trying to ridicule the claims of which I have spoken. He wants to tell the public that "after a month's diligent investigations no grants could be discovered upon them."

It is very strange that, notwithstanding this diligent investigation, the Government, in its tender of July 6, 1878, should say, "In regard to some parts of the above-mentioned lands the Government has given grants for agricultural purposes." Now, whether these grants are merely for agricultural purposes, or even if they are, whether other grants by which the holders of the former are hindered in their labour can be given over their heads to others on the same grounds, are questions to be decided by the High Court, and I think I was right in warning my friends not to reckon on "this source of income" before such decision has been given. As I do not want to intrude on your kindness I will finish this communication by putting the following questions to "A Late Resident in the Colony," which I trust he will answer without using any further personalities:—

1.—Is it true or not that one of the articles of the phosphate concession reads thus:—"The Colonial Government is not responsible for any claim which may arise between the concessionaire and the holders of other concessions of whatever nature they may be, and indifferent under whatsoever circumstances they may have been granted."

2.—Is it true or not that another article of the contract runs as follows:—"The concessionaire is bound to guarantee the Colonial Government for all the consequences of possible law suits which may be entered against the Colonial Government on account of and in consequence of this concession?"

3.—Is it true or not that these conditions have been made by the Government in view of the claims of the "landowners," or holders of the concessions for "purposes of agriculture?"

Now, if these questions have to be answered in the affirmative—and without denying the truth they cannot be answered otherwise—how is it possible to say that the Colonial Government and its law officers laugh at those claims? "Rira bien qui rira le dernier"—so I repeat, wait until the decision of the High Court before reckoning on this new source of income. Notwithstanding the shrewdness of the Curacao shareholders I have the greatest confidence in the case entrusted to me, for against their "shrewdness" I will use a much mightier weapon—"justice," and justice will prevail.

The Hague, Sept. 28.

A. M. CHUMACEIRO, AZ.

THE NEW GOLD FIELDS.

SIR.—If the reports which continue to be received of the recent discoveries of the precious metal in various parts of the world are to be relied on, and there is no reason to doubt their correctness, there is a strong probability that we may at no distant date witness a renewal in a modified form of some of those remarkable incidents and events which exercised such a potent influence upon society nearly 30 years ago. That the desire for gold—the *aura sacra James* of the poet—which has lent its impulse to almost every great movement which has contributed to the distribution of the human family, will not, so far as the discoveries under notice are concerned, appreciably affect the great centres of population may be taken for granted, but its influence will beyond doubt become a considerable factor in determining some rather important social problems.

From India, America, and Australia we have nearly concurrent testimony of the existence of large gold-bearing areas—ground for the greater part hitherto unexplored—more or less rich, and yielding so far as they have been developed, profitable returns, which discoveries, accompanied as inevitably they will be by an extension of mining enterprise on a considerable scale, cannot fail to be productive of significant results. The continued drain upon our stock of gold for export to the Continent, and the efflux of specie to the United States, taken in connection with the gradual falling off in the older and principal sources of supply, has naturally created some misgivings as to the future production of the precious metal. Happily we may consider the probability of a scarcity of gold arising, as a contingency too far removed for present speculation. The gold-bearing reefs which traverse the Ghauts of India, and the auriferous deposits contained in the valleys and ranges of the Wynaad, Mysore, and other districts, have been demonstrated beyond a doubt. The recent utterances of Mr. Brough Smyth—no mean authority on the subject—sufficiently confirm the earlier reports that were received of the mineral value and extent of the new country, which it is known had from a remote period been subjected to intermittent attempts at mining, and establishes the fact of the existence of large deposits of gold *in situ*.

It would be difficult to over-estimate the effect and influence which the development of these gold fields will have upon the future of India, whether with regard to its industrial pursuits or the im-

provement which will naturally follow in the economic and social status of its inhabitants. In Queensland and the northern part of Australia we are assured of the discovery of auriferous tracts of ground of considerable extent—hitherto a virgin area—which bid fair to develop into important gold fields. Prospected by those errant speculators the Chinese, who in their industrious search for "surfacing" have ventured their explorations as far as Port Darwin, poly, has rewarded its discoverers by some of the richest prizes—nuggets varying from a few ounces to a mass of gold weighing nearly 20 lbs. having fallen to their hands.

Probably the most important discovery which has been made in Australia is that known as the Temora Gold Field. The new district is situated about 16 miles from Sebastopol, and a few hours' journey from Cootamundra, a station on the southern line of railway from Sydney. Several years ago a rich quartz reef was discovered at Temora, but it could not be worked profitably owing to the cost of conveying the ore to be crushed, the nearest reduction works being 15 miles distant. In February last a party of miners from a neighbouring settlement visited the locality, and prospected the ground for alluvial gold, having found which they applied for a prospecting area. They were followed by others, who, attracted by the auriferous character of the country, commenced sinking, and who, after considerable labour, struck the main lead; while other shafts, sunk at varying depths and at wide intervals from one another, bottomed on coarse gold.

It is stated that there are three distinct "leads," the sinking being in some parts quite shallow, but up to the latest advices (August 11) the best alluvial deposits are found on the "gutter," at depths varying from 60 to 140 feet. The run of pay-dirt is unusually wide and thick; as much as 6 ozs. of gold has been washed off the bottom of a shaft. Several nuggets have been found, and, as a matter of course, speculation is rife, shares in some of the claims having changed hands for large sums of money. It is impossible as yet to define the extent of this new gold field, but the leads which are at present being worked continue for four miles, and it has been ascertained that prospecting parties have found free gold at a distance of 12 miles from the original shaft. The general opinion is that the Temora is an extensive gold field, whose immediate progress is greatly retarded by an unusual scarcity of water, an element which is hardly necessary to state is indispensable in the development of any gold mines. This deficiency of water is common to the Australian gold fields. In the early history of some of the principal "rushes" in Victoria it proved one of the most serious drawbacks to the opening up of what afterwards became important mining districts.

One of the most favourable features of the Temora Gold Field, as denoting the permanent character of the mines, is the abundance of quartz veins. Along the eastern side runs an almost imperceptible ridge, formed by a quartz reef, which has been prospected, and gives good indications, and on many of the ranges quartz reefs have been discovered. The reefs seem to be directly in line between the rich localities of Barmadman and Sebastopol.

It would be rash to assume that the present developments warrant the expectation that the new gold field is capable of absorbing the mass of floating population which is sure to be attracted thither in addition to the numerous migratory class of the gold-seeking fraternity, to whom, perhaps more than any other, "distance lends enchantment to the view;" but it may be conceded that, for all practical purposes, the Temora rush promises to be a success, and the result of further explorations will be awaited with interest.

Bruckley Villas, Camberwell, Sept. 30.

PHILIP A. EAGLE.

CEDAR CREEK MINING COMPANY.

SIR.—Like your correspondent, "A Shareholder," in last week's Journal, I have been for some time past anxiously expecting to be favoured with some information in regard to what the directors are doing herein, and trust to see in next week's Journal a satisfactory reply to his enquiries, as I consider it only fair the shareholders should be in possession of what is doing with their property.

A HOLDER OF ONE HUNDRED SHARES.

NOUVEAU MONDE GOLD MINE.

SIR.—As a holder of shares in this mine I read with considerable interest the letter from your correspondent, "B. O.," in last week's Journal. It will cheer many an unfortunate shareholder who, like myself, purchased at a much higher figure than the present quotations if his statement respecting the fresh amount of capital can be endorsed. It is too much to expect that a meeting will soon be called to hear what has been done since issuing the invitation for additional subscriptions?

Chiswick, Sept. 30.

W. H. FLETCHER.

RICHMOND CONSOLIDATED MINING COMPANY.

SIR.—Will you allow me, through the Journal, to call the attention of your subscribers and the investing public to the low price at which the shares in this company stand? Comparing the price with that of any first-class English mine this lowness of price is still more palpable. Take, for illustration, the Van Mining Company—a substantial property, and thoroughly well managed, and which description answers equally to the Richmond, and yet the Richmond shares are 3*l.* lower in price. Had I not known their present price, and had been asked to guess—knowing the mine to be practically inexhaustible, which it is—I should have said 30 to 31, and which they are honestly worth.—*Bristol, Sept. 29.*

JOSEPH MARRIOTT.

THE FLAGSTAFF MINING COMPANY.

SIR.—Permit us, as solicitors to the applicant moving to stay the drawing-up of the made by Mr. Baron Pollock discharging the order made by the Master of the Rolls in July last for the winding-up of the Flagstaff Silver Mining Company of Utah (Limited), to state that the announcement made by the directors, and appearing in the Money Article of Thursday, is entirely misleading, and in fact untrue. The result of the motion before Mr. Justice Lush is correctly stated by counsel in the endorsements made on their briefs. The following is a copy of such endorsement:—

Stand over to first motion day in November. Nothing to be done in meantime as to paying away funds of company, or drawing up order of Mr. Baron Pollock or otherwise.—W. H. G. BAGSHAW, J. F. OSWALD.

Comment on the course adopted by the directors in leading persons interested in the company to believe that the company is free of litigation, when as a fact the motion above referred to, and also three petitions for winding up are pending, seems to us wholly unnecessary.

George-street, Sept. 30.

F. W. SNEEL AND GREENIE.

CAPE COPPER MINING COMPANY.

SIR.—Perusing with much interest the reports sent to us monthly by the managers, I observe that those for June and July last do not make mention of any sales of our ores, and of only 850 tons for August and September. This would appear to be a very small quantity in the face of an output of about 5000 tons for those four months; but if, as may be assumed, the bulk of our ores go to the newly-acquired smelting works, to be converted into metal, the quantities and average prices of the metal so sold each month, as well as the ore. I think you will agree with me that it is important that we should be kept fully informed of the prices obtained for all our produce, whether it be ore or metal.

London, Sept. 27.

SHAREHOLDER.

THE SVELTER TRADE.

SIR.—It is a pity there is not a little more unanimity as to selling amongst the British svelter smelters, as they frequently, through inadvertency, play into the hands of operators whose interest it may be for the time being to depress the market, just as is being done at present, although the demand for galvanising purposes is fairly active.

If they find smelters are not willing to sell considerably under current prices, in order that they may "bull" the market, and so take an unfair advantage of consumers, they immediately turn round and "bear" it, and so endeavour to take their profit out of the

smelters. Lately their plan has been to buy from smelters in this country to fill their sales of foreign spelter on this side, and thus enable them to re-sell what metal they hold on the Continent, and so depress the market there. Both the syndicate and outside foreign smelters would do well to have their interest more closely looked after in England.—*Birmingham, Sept. 27.* AN ENGLISH SMLTER.

MINING ASSOCIATION (LIMITED).

SIR,—Can any of your numerous readers inform me what is doing in this company, and what are its future prospects? I cannot understand why we do not have reports like other mines. Are the shares worth anything or not? We never see a quotation for them.

ENQUIRER.

MORE ABOUT TIN.

SIR,—When are we to have a better and a more settled price for tin? This all-important question, as it is and as it is felt, has for many years past hung on the tongue of almost every man of my beloved native county. Great anxiety and disquietude have been and still are felt on the subject of tin, and which is not at all to be wondered at, when in Cornwall tin and bread means one and the same thing. The tin question, I say, is asked by everyone, but by no one seems to receive a satisfactory answer. The solution of this problem seems to be, and no doubt is, beyond the power of man. A correspondent of the West Briton, writing in 1878, said, in reference to Cornwall and in speculating on its future, "Let the calm and thoughtful who wish to know about the future ask Mr. T. S. Bolitho or Mr. J. M. Williams, these are gentlemen head and shoulders above all others in the power of gauging the future, and I think they will tell anyone who may be fortunate enough to obtain their opinions that unless economy be used the future will be of serious consequence to many of the mines." I replied to this in the following words:—"I do not think that it requires the sagacity of a Bolitho or that of a Williams to convince anyone who is connected with Cornish mining that all possible economy is necessary in its prosecution; but why particularise any two individuals as possessing all knowledge? Why should it be thought fortunate to obtain the opinion of Mr. Bolitho or that of Mr. Williams rather than that of all others? They are two gentlemen of the highest respectability, but does their prophetic glance extend further or penetrate deeper into the dark and hidden recesses of futurity than that of all others? I throw not; and were anyone to ask them the reply would probably be 'No.' Stop the introduction of metals from abroad, and it will not require any great depth of philosophy to tell what will be the effect on the immediate future of Cornwall." But, Sir, the prohibition of the introduction of foreign metallic substances into England, even were we fortunate enough to realise this boon, would not be sufficient for the full and complete prosperity of Cornwall and of the other metal-producing counties of England. The rest of the world, and by whose productions England is now inundated, must cease to produce metals, or at least must sensibly fall off in their present production, ere we can properly flourish; for although the produce of other countries be debarred or restricted from entering here, whilst those countries continue to yield even as at present their produce will find its way into all the metal markets of the civilised world, and thereby, as it were, shut the door against us. Will then those countries soon cease to yield, or will their present produce speedily and sensibly diminish? These, methinks, are questions which are beyond the power of man to satisfactorily answer. They are questions too abstruse for human foreknowledge and sagacity, involving a secret which only infinite wisdom can unfold. There can be no question that up to the present day the yield of foreign metals and their introduction into this country have been gradually on the increase. Our most anxious wish and desire are that such a state of things may not continue, but have we any reasonable ground for hope that it will not? Look at the vast extent of tin-bearing area which we already know! Look at the extent of the Indian Archipelago! Not many years have elapsed since it was supposed, or not supposed at all, but taken for granted—certainly with rather a cramped mental view of the nature of things—that Banca was the only stanniferous island in the Archipelago, and we were anxiously looking out for the exhaustion of its tin; but was there a man so devoid of reasoning powers as seriously to believe that in that immense region Banca was the only island in which tin would be found? How stands the case now? Again, is the alluvial tin of Australia and of its adjacent isles almost exhausted? It may be or it may not be for aught that I know, but supposing that it were exhausted to-morrow, what then? Would that be the exhaustion of the tin of Australia? I tell you nay. The alluvial tin has had its source. It is well known that there was a time, and that time not long ago, when an abundance of alluvial gold was found in that country, and that by-and-by the quantity became considerably diminished. What did they then? Did they not search for its source and find it? Did they not find the lodes or veins, what they call the "gold quartz reefs," and work them as *mines* to a very considerable depth by the aid of English machinery? Common sense could not have failed to tell them that the gold of the alluvium must have had an origin. So it is, as a matter of course, with the alluvial tin. A few days ago I read in one of the newspapers that one of the Penance gentlemen, in speaking at a meeting on the general topic—a topic on which we are all so anxious—the tin of Australia—i.e., as to whether the yield was or is to fall off or not—said that in Australia there are no lodes! No lodes! Whence, then, the abundance of their copper ore, and on what are worked their gigantic copper mines, as well as their mines of tin which are now being wrought? Whence the abundance of tin with which they continue to overflow this country? To suppose that there are no metallic lodes in Australia is a novel and doubtless a most erroneous and mistaken idea. Surely the gentleman must have forgotten himself. No lodes! Whence then the alluvial tin? Was it by the rain brought from the clouds? I know that it was brought to the places at which it is now found by the action of water; not, however, by rain from the skies, but from the atmospheric disintegrated backs of lodes on the adjacent (and or) on the remote heights, the disintegration having probably been insensibly going on for myriads of ages ere man was created. Look at the stream tinworks of Cornwall. Have we not proved to a certainty that the tin by the same process (the action of water) was brought from the backs of the neighbouring lodes? Every man who thinks at all must know that whatever metallic substance is found on the immediate surface must have had its source, and that source can only be the denuded backs of lodes. I have said that no one but God, who created the veins and the metals, knows when the cessation of the yield of metallic substances will take place, whether it be in Australia or in any other country, and this I repeat as my fixed and I hope reasonable belief. From the year 1836 to that of 1840 I was in Chili connected with the purchasing of copper ore for the Messrs. Williams, Foster, and Co., and when it was rumoured there that the price of copper was high in England every English vessel on the coast was immediately called into requisition and taken up by the native miners in which to ship their ore to England; so thoroughly did they on these occasions sweep the coast of English vessels that we have had to pay as high as six guineas a ton freight home. The fleet of copper ore-laden vessels dispatched to England would arrive all about the same time, and at once glut the copper market, and down would drop the standard, of course, ere the ore was sold. The shipper disheartened by his account-sales suspends his shipments, but shipowners in England having realised such an excellent freight at once dispatch their vessels back to Chili, with the expectation of having the rate repeated. The vessels arrive and crowd the coast to find no employment, so that in these lulls in the shipping of ore instead of paying six guineas a ton freight we have chartered at 35s. These suspensions in the shipping of ore would continue until the next rumour that the price of copper in England was up, when again would be dispatched the copper-laden fleet, to arrive together again in England—the former result repeated; the market deluged with ore, and down would drop the price. Thus it was with the Chilean copper ore, and thus it is, in a degree, with the Australians relative to their sending hither their tin or tin ore. The price of tin being low they to a certain extent withhold; the price being up, they augment their shipments. Thus it is, and no one knows when this state of things will alter. You may ask Capt. Teague or Capt. Boyns, Capt. Dick or Capt. Tom, all the tin raisers and all the tin buyers, all the merchants

and all the aristocracy of England, and unless there be arrogant assumption the candid reply of each and all will be "I don't know; I am ignorant of the matter. It must depend on the duration of the yield of foreign metals, and the length of that duration is beyond the power of man to determine." I have, notwithstanding all, a strong hope and great confidence in that Cornwall will triumph; that by economy and good sound management of her mines she will vanquish and overcome the opposing world. JOHN LEAS.

London, Sept. 27.

TIN AGAIN.

SIR,—I see by the last Saturday's Journal that at Wheal Pevor meeting, of Sept. 21, Mr. R. Boyns stated that, "with regard to the price of tin, he has constant information from Australia, and that he is satisfied that they have only alluvial deposits, and have no lodes," although the same number of the Journal states that the tin mine Mount Bischoff, in Australia, has within the last six months, and from a depth of only 27 fms. from the surface, realised profits to the amount of 35,000/. Should Mr. Boyns happen to see my letter on the tin question in next Saturday's Journal, he will see that we differ in opinion. I must beg pardon for this. I never have seen Australia, neither, in order to prove the fallacy of Mr. Boyns' statement, do I want to see it. As well might a baby be born into the world without the existence of parentage as that there could be alluvial tin without an origin, and that origin is a tin lode. Will Mr. Boyns pardon me in this also?—London, Sept. 30. JOHN LEAS.

LIST OF SMELTING COMPANIES.

SIR,—We find our name is not included in the List of Metal Companies in the Supplement to last week's Journal, which is, no doubt, an omission, as we have been smelting a good many years, and are regular buyers at the Swansea Ticketings.

THE LANDORE COPPER COMPANY.

Copper Smelting Works, near Swansea, Sept. 27.

MINING—PRACTICAL AND THEORETICAL.

SIR,—Your correspondent Mr. E. Halse, A.R.S.M., seems to be sadly nettled at my depreciation of theoretical mining. As he says "I speak practically," it would appear that he wishes to pass for a miner, but from his phraseology and the nature of his observations on mining I feel sure that he is not, or if so a most superficial one. He appears to think that to learn how to use the pick is all that is required as the qualification of a miner, and says that "unless the school pupil be unusually stupid he can acquire this simple thing as well as the knowledge of judging of the hardness of the rock and of the price that should be paid for excavating it merely by the usual occasional school visits to the mines." Is this all that it is necessary for a miner to acquire? He says, and says rightly, that it is not necessary to be digging mole-like underground all one's days. This I concede; but it is indispensable if ever a person is to be made a miner in a proper sense, and to become fit to take the responsible situation of the manager of a mine, that he goes at it in boyhood, and to remain unceasingly at it until ripe in manhood. If this be not the case he will never even "use the pick as a thorough-bred miner uses it." I have had several practical instances of this. Many years ago, when in the management of mines, I had a man with me who had worked underground twelve years, but who in early life was bred a butcher; he could never use the pick like a miner handles it. Elbows out, at right angles, a narrow gunnis was out of the question for him, and as to the price of a tribute pitch—for it was at a copper mine—he had no idea of the nature of the lode as to whether it indicated poverty or riches, improvement or decline, he attempted to advance no opinion. At a gold mine in Brazil we had a pupil of the celebrated Freiberg School of Mines sent out as manager—they might as well have sent out a washerwoman. As soon as his head was below the surface he was dumb—as much out of his element as a fish would be out of the water. He was kept there a short time to make a map or two, to do a little surveying, and sent away.

Mr. Halse seems to deplore my ignorant and untutored condition in not being able to appreciate learning. He, however, mistakes his man. I am fully aware, and have always said, that in proportion to the amount of general useful instruction with which the practical miner can store his mind will be his general usefulness, and that upon the principle that a well-educated man is to be preferred to an ignorant uncultivated one. What I reprobate is the ridiculous and absurd idea that mining can be taught at a school, or by the method by which the school pretends to make miners. I repeat that as well might tailoring be taught by a blacksmith as could a miner be made by attending the so-called School of Mines or at any of its kindred institutions. I require no sympathy from your correspondent on the score of ignorance relative to things connected with mining, for I am perfectly conversant with all the school theory—including the mighty matter of "mine surveying"—in addition to, probably, a longer and more varied practical experience than most men living.

Sept. 30.

A PRACTICAL MINER.

WEST CHIVERTON MINE.

SIR,—"Give a dog a bad name," &c., is an old saying which most of your readers will have seen exemplified as well in their mercantile as in their human experience. And in nothing more than in mining do we see how disastrous it can prove. Many a good old mine in its days of adversity (and where is there a mine which has never experienced such days more or less) has undeservedly suffered, and in some cases been ruined by the operation of this influence. One of the most long suffering of these has been West Chiverton. Ever since the middle of 1878, when it began to lose its favour in the public estimation, it has been looked upon and spoken of as a used up mine. Its past success has been forgotten, and its glory blotted out by the amount of adverse criticism levelled against it. Having seen all this, and knowing as I do (and in which knowledge I am supported by Capt. Southey's report) that "there is life in the old dog yet" I feel a kind of compulsion to do what I can to advance its claims, and if possible to bring it back to public favour and esteem. If what Capt. Southey has stated be true, and we have no cause to doubt his veracity and experience, there is very little doubt that the mine will take its position once more as one of the best in the county of Cornwall, and that before very long, ever since Capt. Southey wisely determined to abandon the lower workings and direct his operations to the shallower levels, there has been a brighter outlook for West Chiverton. These latter levels were the points from which the principal riches of the mine were extracted, and from which the numerous and large dividends were realised, and it has always appeared to me that too much haste was manifested in abandoning their further development for the purpose of sinking the shaft and driving further levels in search of greater riches. Now that the men have been brought back to their former workings we shall not be long before we hear of something the reverse of "calls," as all the expensive and unproductive labour has been given up, and we are already informed by Capt. Southey in his report of the 23rd inst. that "the 80 fm. level going east of Hawke's shaft is looking exceedingly promising, occasionally producing some splendid rich silver-lead." So much for the 80 fm. level. In the 70, where a cross-cut is being driven to intersect the side lode, he reports that he "never saw the ground we are passing through looking so kindly, and the end is letting out an immense quantity of water." What can be more encouraging than the above? Why if such reports had appeared in the *Mining Journal* from East Van or other similarly well nursed projects of public favour we should immediately have been startled by a rushing up in the price of shares similar to the one some three or four years ago, when in a week or two's time East Van shares advanced from so many shillings to as many pounds. At the present time, although it has been working for so long a time upon a hope deferred, and with the same delightful prospect before it, East Van is selling at something like 50,000/. Any of your readers comparing West Chiverton, its past and present position and prospects with those of East Van cannot fail to be struck with the anomaly of how they are respectively estimated by a discriminating public. While the one is estimated to be worth something under 30000/, the other is selling at 50,000/. If West Chiverton received the same favour

that East Van is now doing, and which I contend the former is more entitled to, the shares would be now selling at 16/. instead of 16s., at which I believe they have been recently bought. As I said at the beginning, West Chiverton has been the victim of a bad name, and has suffered accordingly. It is gratifying, however, to find that it has not sunk under it entirely, and that there is a prospect of an early regeneration.—Sept. 29. OBSERVER.

TECHNICAL EDUCATION FOR MINERS.

SIR,—A misprint or two occurs in my letter which you did me the favour to publish in the Supplement to the Journal of Saturday last which require correction. I did not write commonsense facilities and parts, but "commonsense faculties and parts." Again, in respect of the blowpipe, I did not state that so-called practicals know nothing of its use, but that—to quote the sentence in full—I stated, "In gold and silver regions its service is of inestimable value, but do so-called practicals know nothing of its use?"

I could give a different account of things, meaning thereby that I, myself—as well as many other practically educated miners—might be found not very far behind scholastically educated practitioners—I mean so far as quantitative analysis of the useful metals of commerce is concerned, and some of the qualitative so far as practical mining and its results are affected by such experiments.

I presume it matters not by what means or through what instrumentalities knowledge is acquired so far as the knowledge is concerned, as knowledge is knowledge, and cannot be ignored. And "knowledge is power;" power supreme when prudently exercised, by whomsoever possessed.

Theory is relative to both the technically educated and practically initiated miner, only in a reverse sense. Thus, technical education merely qualifies a person to theorise, whilst theory, as exercised by the practical man on a basis of known estimable and incontrovertible facts, qualifies him for immediate confident procedure. The sum of the difference between the two classes appears to be included and contained in this distinction, and between which, for all practical purposes, there is no comparison. If it is not a machination of evil on the part of the technically educated aspirant to brand the practically initiated miner with an inherent and irredeemable stupidity, let him honestly avow himself to the contrary, and accord honour to whom honour is due. Practical mine managers, though it may not be said of all, are not ignorant of the sciences appertaining to mining, and this some of those conceited pedants may be taught to realise, if they, or either of them, have the temerity to question the fact.

ROBERT KNAPP.

Llanrwst Lead Mine, Sept. 29.

TECHNICAL EDUCATION FOR MINERS.

SIR,—In my letter in the Supplement to the *Mining Journal* of last week I intimated an intention of replying to the assertion of the last remaining vestige of the old school—"that the mine managers of the present day consist of broken-down clerks, secretaries, and captains, who sign themselves C.E. and M.E., but know nothing of mining, and whose pretensions are sustained by their impudence." And also to your statement "that the most competent Welsh or Cornish metalliferous miner when sent out to a gold mining district, or, indeed, to any foreign mining district, is as completely lost as the merest theorist." If I treat of the latter assertion first it will be for convenience, and because I myself, to go no further afield, can give the most positive and emphatic contradiction to such statement from my own individual experience. I have traversed some—and somewhat extensively—of the gold and silver regions of the Western American States, and been subject to most of the adverse influences for the purpose of deception known at those times, and have never found myself at fault in their detection; on the contrary, felt as much at home and at ease on the subject there as here. I officially examined on behalf of a New York Company hundreds and hundreds of mines and claims intended for and called mines, in company and concert with an eminent professional civil engineer and teacher of geology and engineering science at West Point, New York, who, amongst scores of others, is my witness that I found no difficulty in deciphering Nature's hieroglyphics or man's artificial allurements, and they were not a few that I came into contact with, and doubtless there are many other English agents who can say the same. It is not often that the genuine article is rejected but that counterfeits are endorsed, yet occasionally the former happens. I have in my mind's eye a case, and I think one to which you have referred in your remark—"that the most competent and Welsh and Cornish metalliferous miners when sent out," &c. If I am right in this conjecture I am at a loss to know with what propriety and with what reason such complimentary terms "most competent" can be ascribed to them. If I were appealed to I should most unequivocally reverse the judgment. I refer to what is now and has almost ever since been known as the Eureka Consolidated Mines. If I am wrong in this conjecture I will thank you to correct me, but that is the only instance of which I am acquainted of a Welsh and Cornish agent having been sent together to make an inspection and report of a foreign mine, and most unfortunate was the result both as to the parties contemplating that purchase and its indirect consequences to others. I have been always under the impression that most of our English misadventures in the Pacific States were traceable to that event. I might say a great deal more on the subject, as I was a resident of Nevada at the time and knew a good deal about matters, but am not certain that this case is one you have referred to. I did not know the Welsh agent in question, but the Cornish agent I did both in this country and that, and nothing astonished me more than the information and fact of his having been sent out to the State of Nevada to either inspect or manage a mine. This may not have been an exceptional case, nor was it, as I know of another which followed close upon it the reverse of this in quality, capacity, and promise; the one disapproved and condemned, the other approved and extolled, both being stupid blunders on the part of the experts which might have been easily avoided. But is it fair or reasonable because of such occasional occurrences to brand the whole fraternity with sheer incompetency, and indiscriminately consign its members to the limbo of official infamy? Mishaps of the kind are greatly to be regretted, but how much on the other side might there not be set over against them of which we hear little or nothing, except just for the moment, unless it should appear necessary to the schemer's interests to extol in vulgar praise the official merits.

The conclusion you have arrived at from the comparison instituted between the celebrities of the past and the mine managers of the present time can be by no means sustained. I am a witness in this case also. My own personal observation and experience extend back to those times you have adverted to, and take cognisance of an entire generation of time, and the remnants of two others, the one preceding the other succeeding the past generation. It is pertinent to this question that I should state to what period in the past my memory and experience can betake me, otherwise it might be questioned if I were competent to be a witness in the premises. It goes back to the time of the old Capt. Rule's retirement from the active management of Dolcoath Mine, who was succeeded by Capt. Wm. Petherick, at whose death the late Capt. Charles Thomas succeeded to the management, and embraces three generations of the Thomas's—the old Capt. Charles, the late Capt. Charles, and Capt. Josiah, the present manager of that mine. In like manner it includes three generations of the Vivians, and years before the Lyles made their appearance in West Cornwall.

To institute a comparison of those times and the men of those times with these times and the men of these times a somewhat critical review of what was and what is would have to be resorted to, which unprovoked I would never attempt, not because I apprehend failure, and therefore fear the result, but because it would be unfair—may, unjust, because so one-sided to arrange the acts and shortcomings of our respected predecessors whom the order of events have consigned to the realm of silence. It would also be unfair to rigidly draw a comparison between those comparatively unenlightened days in mining and those more favoured days of the present time. I mean as to mining knowledge, and not the wealth of the mines of the present as compared with those of theirs, for there is as great a contrast in

the mines as in the managers and agents themselves. And this is the secret of their eminence—the superabounding wealth of the mines they managed, and not to their superior skill, devotion to their duties, and judgment, for these did not exist. Will the respected survivors of the olden time inform us who it was that virtually abandoned Dolcoath the moment it ceased to be profitable for copper, when in its transition state from copper to tin, by causing 60 fathoms of the pitwork to be drawn to the surface, inundating the lower levels, and if that proceeding is an index and evidence of good mining? I was there when it was done, and vividly do I remember the astonishment and condemnation expressed by the more intelligent workmen at and of the act, and their positive asseverations that the most valuable part of the mine was abandoned, or about to be.

Was it not said to the manager, Capt. Wm. Petherick, and probably to all the agents at that crisis, that the mine must depend on itself; if he could make it meet expenses well, but if not it must succumb. That all faith in its ultimate resources was exhausted, or rather never existed. That no contributions by the shareholders would be forthcoming towards its sustenance. And who, may I ask, was responsible for the mode of working which involved the mine in that disaster? Was it not one of the parties celebrated in your category, and to some extent, whether rightly or wrongly, in the annals of Cornish mining, and whose fame it has been aimed to perpetuate at the expense of equally meritorious and much more enlightened miners. Those of us whose experience embraces the times and circumstances referred would have no difficulty in defending the position I have assumed both as to foreign mining and mining in this country past and present.

ROBT. KNAPP.

Llanvrest Mine, Sept. 29.

BORING MACHINES.

SIR,—The advocacy of boring machines through your columns has borne some fruit. In a tour through the mining districts of Cornwall I find if one commences at the far west—St. Just, Wheal Owles, Levant, and Botallack have all laid out money in boring-machine plant, and are pushing a head to a hoped success. On the southern range of Carn Brea hill Wheal Grenville, West Frances, West Basset, South Frances, and Wheal Basset have all adopted machinery for the speedy development of the lodes. At the last-named mine (Wheal Basset) a pair of 20-in. engines 3 ft. 6 in. stroke with two air compressors of 18 in. cylinders and 3 ft. 6 in. stroke have just been put to work. It is calculated to supply air for ten to a dozen machines when the great Flat lode is intersected, which will be accomplished in a few months. East of Wheal Basset one or two rock drills are working at North Penstruthal driving a cross-cut south to cut the 40 ft. lode. North of the Carn Brea range, Dolcoath, South Crofty, East Pool, New Cook's Kitchen, Wheal Agar, and West Tolgus have adopted the rock drills. The only mines of any magnitude in hard ground where they are not working are Carn Brea and Tincroft, which are expected will soon constitute no exception.

By the application of rock drills the great advantages have been increased speed in laying open the mines, purer air and better ventilation, less laborious labour, and better wages. Good energetic men who will work earnestly have no difficulty in obtaining 4l. to 5l. per month, and if the men would take contracts 30 per cent. more might be made. When the working miners throw away their remaining prejudices and sink shafts at the rate of 1 to 3 fms. per week, as has been done, we may expect miners' wages to rise still higher, and mines become more profitable from increased returns and reduced permanent charges.—Sept. 29.

ALPHA.

CORNISH MINING—ITS UNWROUGHT GROUND A PROFITABLE SOURCE OF INVESTMENT—CHEAP SHARES.

SIR,—In the great mineral field the subject of this letter embraces it cannot be disputed there are mines now in embryo which, on deeper development, may prove of equal value to some of the mines of bygone days, and no ground is more likely to contain paying deposits of mineral than the unwrought ground in the vicinity of and traversed by the same veins. I have now before me statistics of eight mines within a radius of two miles which divided an aggregate profit of 1,723,000l. I still contend the working of the same lodes in new or unwrought ground give greater chances of success, and with much less risk, than the working of deep, watery, hard ground mines. Around the rich mines alluded to a few may be selected (selling at a low market price) as likely to prove very productive, and I have not the slightest doubt will shortly add prizes to their number; the important improvements in their general character in the past month justifying this opinion. It is moreover important that they are in precisely the same formation as several of the neighbouring mines that once figured amongst the greatest and richest mines in Cornwall, and I would venture to predict within the next few months they will stand as high in market value as they are held in the estimation of some of the most eminent mining authorities of the county.

St. Day, Scourier, Cornwall, Sept. 29.

CHAS. BAWDEN.

CAMBORNE, AND ITS MINES.

SIR,—The parish of Camborne is remarkable in several respects—geographically, because of its great length in comparison to its width, being about 8 miles long and only from 1½ to 2 miles wide; mineralogically, because of its enormous products of copper and tin. I presume that the oldest mines in the parish are Stray Park, Camborne Vean, and Dolcoath—all the rest being comparatively modern. The profits from these mines are known to have been very considerable in ancient times, and at the present time Dolcoath is giving good dividends, and likely to do so for many years longer. Stray Park sett is merged with Dolcoath. Camborne Vean and Stray Park have yielded no profit in modern times; but they are not exhausted. Carn Camborne is southward of Camborne Vean and Stray Park—a promising mine of tin and copper. Wheal Harriet, adjacent thereto, is idle. Pendarves Consols (late Condurrow Mine) is being re-opened on a small scale. South Condurrow, set to work about the year 1850, is a dividend mine; Wheal Grenville, contiguous at the south, will soon be in the Dividend List, if I guess correctly. East Grenville has been added to this sett. South Grenville is idle. It was worked a few years by late Lyle and Co. South Tolcarne is a small mine west of South Condurrow, on which there is a small pumping engine. Wheal Tryphena (as called after the late Mrs. Pendarves) was worked by the late Capt. Joseph Vivian and Co. for tin, with a loss; and afterwards, for a short time, by Capt. R. Iryor and Co.—West Condurrow was worked by a company formed by Mr. Almond Paul, and went down with a loss. Wheal Nelson, near Pendarves (lastly called “Pendarves and St. Aubyn United”) was worked under the management of Capt. Joseph Vivian and Son, with the like result. West Stray Park, the like. This mine should be resumed; but Mr. Pendarves, unwisely, declines to grant a sett. North Dolcoath, a mine near Berripier, yielded some silver ore of very high produce—of about 500l. per ton. Capt. J. Vivian and Son were managers. It has been idle about 12 years, and should so remain, in my opinion. West Dolcoath is on the boundary between Camborne and Gwinnear. It was never fairly worked, although numerous efforts were made to form a company for doing so.

South Roskear is said to have yielded large profits before North Roskear was opened; 300,000l. is alleged to have been the profit in South Roskear. North Roskear was cut rich about 60 or 70 years ago. Captain J. Vivian was manager here during all its riches, and partly during its poverty—in all about 50 years, at 21l. per month. The mine and Capt. Vivian's character fell together. “A poor bal makes a poor captain.” While the dividend lasted he was a first-class manager, but no longer. Total dividend about 110,000l. It has been said that Captain J. Vivian spent all his salaries in speculating in mines where he was manager. He had other sources of income, so that up to his death he had all the comforts of life in sufficiency. He resided and died at Rostradinnick, near Camborne, a beautiful villa, upon which he expended a large sum in ornamentation, &c. It is a leasehold, under Mr. Basset, and is now occupied by his intelligent son, Mr. W. C. Vivian. Wheal Seton was worked many years at a loss, but afterwards large profits accrued. About the year 1848 or 1849 West Seton was set to work by the late Capt. John Lean and Co. Many

years elapsed before any profits were derived; afterwards very large profits were divided. South Seton, which is situated to the west of West Seton, was a very poor mine from first to last. Some of my fellow citizens suffered largely therefrom; in particular Mr. E. Michell, and the late Mr. John Tippet, auctioneer. It is said to have broken Mr. Tippet's heart. Of West Roskear I know but little. It has been wound up two or three times for want of capital to open it fairly. I believe that the machinery is *in situ*, and that it is likely to be worked again shortly. It is said to be well worthy of a fair trial, which it has not yet received. Wheal Rome is included in this sett. West Tresavean is an old mine near the southern extremity of the parish, idle 30 or 40 years. The aggregate profits on mines in Camborne I estimate at two millions sterling.

R. SYMONS.

Truro, Sept. 30.

EAST LOVELL.

SIR,—Referring to “Investor's” remarks in the Journal of July 31 on this property, wherein he states “that the mine was opening up well, and a good working balance in hand,” I must confess surprise (if those remarks were true) at the present price of the shares which, if I am correctly informed, is about 7s. 6d. per share, nearly 30s. a share lower than when “Investor” wrote “there is no chance for a further fall in the shares, so a buyer at present has nothing to lose but all to gain.” Being one of those unfortunates who purchased prior to “Investor's” remarks, when shares were upwards of 3l. each, I should be extremely obliged if any of your readers can explain the reason why these shares are now so low in price, and also what are the present and future prospects of the concern?

OBSERVER.

MORFA DU MINE.

SIR,—It may have surprised a good many shareholders of this mine to have been applied to for more capital to continue the work in the face of such uniformly favourable official reports regularly published through the medium of the Journal. For my own part, I hardly think it a fair application, knowing as I do that this mine's produce, although not yet fully opened, is amply sufficient to pay its own working expenses. There is at the present moment 1000 tons of bluestone on the surface ready for market. Then why not sell this? It is idle to speak of no market when we know how its neighbour—the Mona—export theirs at a very fair profit. I imagine the directors of Morfa Du are too old-fashioned in their ways to meet the views of present dealers. It is not business to stick up for a nominal price per ton, and why should they fear selling by analyses the same as the Mona Company does. Here is a mine producing copper, sulphur, and bluestone, having on hand a heavy stock of these ores, and still we are applied to for more capital. Then what is to become of its abundant produce? This young mine is not by any means fully developed, and will in a short time assert its independence, but meanwhile the directors must not chase away the confidence of the public by a very untimely application for cash.

SHAREHOLDER.

WEST POLGOOTH.

SIR,—When I was riding into the village of Sticker a few days ago in company with a friend he said to me (pointing to some shafts) “that is West Polgooth.” He told me that he considered it a very promising mine; but he understood that the men had been unpaid for some months, and that the manager had mysteriously disappeared. I do not vouch for the truth of the latter statements, because the manager has been held to be a very respectable man. If the statements are erroneous he will, I dare say, set your readers right on those points. I never visited West Polgooth; but from its position I should think well of it. It is not far from South Polgooth, but is a distinct mine.—Truro, Sept. 25.

R. SYMONS.

MINING COMMITTEES.

SIR,—There is a difference of opinion as to the advantage of having “a committee of management,” so called, attached to the official staff of our mines where there is an efficient manager of unquestioned ability. If a committee be of any advantage whatever why do not all mining companies severally adopt it? Why should there be a committee for Dolcoath, and none for Tincroft or Carn Brea, &c.? No persons question the ability of Capt. Josiah Thomas to manage a mine any more than they question that of Capt. Teague. My opinion is that all the advantages, if any, are derived by the committee themselves, who meet once a month, more or less, at the expense of the mine, to talk over their own affairs, and arrange for supplies of goods, and for the purchase of tin, &c. People having a large interest in a mine are naturally excused for so doing; but to call such a committee one of “management” is a farce. The company is not a whit the better off for any such attendance; so the dinner, wine, &c., provided for the occasion is so much wasted so far as the company is concerned. If you cannot trust the manager with the conduct of the operations for two or three months (between the mine meetings) dismiss him, and appoint another; or, if it can be shown that a committee is of any service, then let every mine have a committee. When I was a very young man committees were very rare bodies, and at the present time the benefit of their existence is problematical.

Sept. 25.

OBSERVER.

BREAGE AS A TIN MINING DISTRICT.

SIR,—“A Breage Miner” has written a letter under the above title. I agree with him that Breage is a first-class tin-producing parish, and that there are numerous unexplored lodes in it well worthy the attention of searchers after that metal. Wheal Vor and Godolphin Old Mine should be avoided; but there are lodes in Godolphin (which is a very large estate) almost entirely unwrought. Only the old mine should be discarded. Great Work Mine, now in the hands of Capt. Teague, has given large dividends, and I doubt not, will give more. It is a large sett, and not half explored in its western portion. Treman's and Pollard's would pay well. Between Tolmenor Hill and the English Channel the lodes are very numerous and generally unwrought, except near the surface, by the ancients. Polrose is a promising little mine, only slightly worked as yet. Shafts to test the lodes in the western part of the sett should be sunk to open up tin ground. There is a great length of unwrought ground between Polrose Mine and Tregoning Hill. The lodes in Ruth Dower, Trenear, and Crawle are worthy of attention. Crawle should be added to Polrose. Wheal Wallis (formerly called Cruett Mine till 1840) also deserves attention. Old Wheal Fortune and Wheal Metal I would not touch. It is true that Wheal Metal did give large profits; but it was stopped, after a patient endurance of losses, for its poverty, and I cannot believe it has grown rich since. Pollard's and Treman's should receive instant attention. If I were as rich as Capt. Teague they would soon be set agoing.

R. SYMONS.

Truro, Sept. 25.

[For remainder of Original Correspondence see this day's Journal.]

ENORMOUS BLAST.—The well-known granite quarry of Messrs. William Sim and Co., at Furnace, has been visited by the magistrates and members of the Town Council of Glasgow, who had the pleasure of witnessing a big blast which it had been arranged should take place immediately on the steamer arriving at a safe position opposite the quarry. The attention of the passengers was directed to a black mark on the eastern side of the quarry face, a considerable height above the quarry floor. This was the mouth of the mine which led to the chambers charged with the gunpowder. The mine, it may be explained, penetrated to a distance of 50 ft. where a shaft was sunk to a depth of 50 ft. At the foot of the shaft there were branching mines. One went in a direction towards Loch Fyne to the extent of 16 ft., including the formation of a chamber excavated to contain 5000 lbs. of gunpowder. Another passed in a northerly direction to a considerable distance, at the end of which was a chamber for 3500 lbs. of gunpowder. The chambers were communicated with by means of electric wires, and immediately on the signal to “fire”—the blowing of the whistle—being given from the steamer there was a tremendous upheaval of a large portion of the mountain side. The lines of displacement were calculated to be equal to about 18,000 cubic yards, or 37,000 tons of material. It was afterwards estimated that

a much larger quantity of rock and debris came down. The blast was entirely successful, and the sight was an exceedingly fine one.

REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

Sept. 30.—The reduction of ironworkers' wages, referred to below, had the effect on ‘Change in Wolverhampton on Wednesday, and in Birmingham this afternoon, of strengthening buyers' previous disposition to postpone all possible buying of iron until the Quarterly Meetings. These will come off on Oct. 13 and 14. Consumers this week stated that at those gatherings they are expecting a fall in marked bars of 10s. per ton, and buyers of less valuable iron have already begun to demand easier rates by from 5s. to 2s. 6d. per ton as the result of the lessened wages scale. At present, however, makers generally refuse to give way; indeed, the sheet makers are privately negotiating, with a view if possible of more united action in the matter of prices. The pig-iron market was rather easier this week as regards best sorts. Native all-mine pigs were obtainable at 3l. 7s. 6d. to 3l. 5s., and hematites, for which the open market quotation remained at 4l., were to be had at 3l. 15s. when business was really meant. Two furnaces making all-mine iron have been damped down by the Tame Iron Company, and a furnace making a medium quality by the Willingsworth Iron Company.

The accountants to the South Staffordshire Mill and Forge Works Board from Wolverhampton issued on Wednesday their report to the secretaries of the board on the net average selling price of bar-iron by 12 selected firms during the three months ending August last. It is as follows: “We beg to report that we have examined the returns of the bar-iron of the sizes specified in our instructions sold by the 12 selected firms during the months of June, July, and August last with their books, and have fully verified the same. We find that the net average price obtained during that period has been 6l. 19s. 5d. 4 per ton.” Appended to this was the following, signed respectively by the employers and the operatives' secretaries: “We beg to annex a copy of the accountants' certificate, which fixes the rate for puddling during the current quarter at 7s. 6d. per ton, and millmen's wages in proportion.” This is a reduction of puddlers' wages by 1s. per ton, and millmen's wages 10 per cent., and will, under the sliding scale of the board regulate wages up to the close of the year. Puddlers' wages during the past quarter have been 8s. 6d. per ton; they will now become 7s. 6d. It was made known on ‘Change that whilst the net average price obtained by the 12 selected firms for bar-iron during June, July, and August was only 6l. 19s. 5d., the average in the three months preceding was 7l. 17s. 10d., hence the drop.

The miners of South Staffordshire and East Worcestershire are beginning to move for an advance in their wages. Meetings are being held in the various districts to discuss the wages question, and a deputation has been appointed to wait on the chairman of the coal trade requesting him to advance the price of coal and miners' wages.

A petition was filed in the Walsall County Court on Wednesday on behalf of John Frederick Ison, trading as the Swan Iron Company, Darlaston. The liabilities are set down at 6000l., and the assets at 4000l.

A petition has been filed in the Walsall Bankruptcy Court, on behalf of John Frederick Ison, Darlaston, ironmaster, carrying on business under the name of the Swan Iron Company, Darlaston, and residing at Highfield, West Bromwich. The liabilities are estimated at 6000l., and the assets at 4000l. Mr. H. Travers Edge, Birmingham, is the solicitor acting in the matter; and Mr. A. H. Gibson, Waterloo Chambers, Birmingham, has been appointed receiver.

REPORT FROM CORNWALL.

Sept. 30.—Probably there is no more unsatisfactory matter to write about in connection with mining than the course of the tin market, and we are rapidly coming to the conclusion that, for the time at any rate, the topic is quite as well let alone. It defies all immediate remedy, and the day of better things appears to recede as we hopefully advance. We question much whether in regard to any other article of commerce of such wide utility and universal consumption such a state of things does or could exist. The value of the official quotations of our smelters has deteriorated more than ever; and no price seems staple beyond its own day. Of course there must be an end to this some time or other, but it baffles us to fix the period, and the “hand to mouth” feeling which it necessitates is anything but pleasant. “Where 'tes there 'tes” is quite as good a rule now for the tin market as it used to be (indeed, still is) considered for the whereabouts of the ore. Still, there is less cause than ever for discouragement.

We have more than once questioned the opinion that with black tin at 50l. a ton only a very few mines could pay their way—much less pay dividends; and we have again and again pointed out that in some mines, at any rate, the economies introduced during the past few years have been equal to a saving in the cost of producing black tin of from 15l. to 20l. per ton, whilst all more or less have reaped a substantial advantage. Of course mines differ widely in their conditions, productiveness, and expense of working—few things of the same class more so—but one is every now and then tempted to ask whether all is done in the way of economy that can be done, and in the adoption of improvements, even in concerns that have deserved a high reputation. We do not despise even petty economies, and can quite see that the much abused “count-house dinners” are less defensible now than they were half a generation ago (though after all they are a mere flea bite in the expenditure of an established mine); but to produce any really practical effect we must go very much further than this. It is not after all so much the way in which the customary system of working is carried out, but the system itself that requires examination and change; and this we are almost hopeless of seeing carried out to the desired extent while the absurd prejudice against educated miners—so often apparent in the correspondence of the Journal—is fostered. It is hardly possible to name a single important improvement in modern mining which has not originated outside the ordinary “practical,” and the adoption of which has not been retarded for years by his obstinate adherence to the old ways. The most recent instance of this is the introduction of the boring machine; but that is only typical.

In saying this we have no wish to disparage the trained practical miner. If we had to choose between a thoroughly efficient miner, who had worked his way up in the school of the mine itself, and a man who owed all his knowledge of mining to books, we should not hesitate a moment in selecting the former. But if we had to choose between two miners, both practical in the ordinary sense of that much-abused term, but one having in addition such training as the classes of the Miners' Association would give him, we should have no more hesitation in choosing the latter; and that is really the direction in which this important topic should be discussed, without the little jealousies which are every now and then so plainly apparent, and that not on one side only. So far as the Miners' Association is concerned it should be borne in mind that its chief award—its medal—can be given to working miners only.

This, however, is rather a digression from, though it has close connection with, the matter we had specially in view—the point to which by the introduction of improvements in raising and dressing the ore, by the cost of black tin when it enters the market can be reduced. As we have said, one mine cannot be taken as an absolute guide or test for another; and yet important lessons may be drawn from the comparison. Wheal Eliza has the reputation of putting its ore on the market cheaper than any other mine; but Wheal Peevor is not very far behind, having declared nine dividends at an average price of 40l. 8s. 9d. per ton (commencing at 35l. 12s. 6d.), and having lately been returning black tin at 28l., which, with black tin at 50l. per ton, would give about 44 per cent. of the receipts in profit. And Dolcoath, though the deepest mine in the county, can produce black tin at a trifle over 41l. per ton and thus give, at 50l., about 18 per cent. on returns.

We are quite convinced that if this matter is closely tested the number of mines that can yield a profit, even at the 50l. limit, is much larger than is commonly supposed, and that the differences of rate are not in all cases to be attributed to necessary conditions. Hence our reason for regarding the tin mining of Cornwall as based

upon a more stable foundation than those who are apt to be guided mainly by market fluctuations. These are facts which must be apparent to those who study the question on any wide basis, and do not confine their attention to individual cases, which are very apt, innocently enough, to mislead. The wider the experience the more trustworthy the deductions.

Few mines have seen fewer fluctuations than South Caradon. With only two brief intervals (and in these the mine has always paid its way) it has been a dividend-paying concern ever since the time when, getting on for 40 years ago, its fortune was made by a stroke of a pick. Now, for the first time in its history, its accounts show a loss, and that of just 900*l*. To this, however, it would be unwise to attach undue importance, as the returns keep up so well, and the shareholders have this consolation that the finances of the mine have always been kept in such a position that there are no hidden dangers to fear, and that the concern is in the best possible position to tide over an adverse period. It is a regrettable coincidence that the first account which shows a loss should also be that of the retirement of Mr. J. G. Dymond from the purshership. Mr. Dymond has been identified with the mine from the very earliest, and long before he undertook the purshership himself was associated with his venerable uncle, Mr. Kittow, the father of South Caradon, in the conduct of its affairs. A more efficient and a more courteous and gentlemanly purser than Mr. Dymond no mine has ever had, and nothing in his retirement will cause more regret than the fact that it is due to failing health. South Caradon has long been a model mine, and we have no doubt that under its new regime it will maintain its reputation, for Mr. Rule, the new purser, is no novice in its affairs. It will be seen from the accounts that the adverse balance is due entirely to the low price of copper. Had the figure of the previous quarter been maintained so would the dividend. But this state of things cannot last.

It is stated that the Great Western Railway Company are likely to take over Par Harbour, which belongs to the Treffry estate, and which is admirably situated for doing a large amount of mineral traffic, in addition to its present business.

REPORT FROM NORTH WALES, SALOP, AND CARDIGAN.

Sept. 29.—I am happy to be able from personal observation to endorse the remarks made by "Miner" last week respecting the appearances at the new mine of Neuadd Llwyd, or, as it is called by the owners, Bryn Dyfi Mine; the piles of ore on the surface are large and numerous for so young a mine. It cannot be said that lead mining in Montgomeryshire is very flourishing just now, and the town of Llanidloes, which largely depends upon this industry, has at present a dead aspect. Carnarvonshire also—at least the north-east part—cannot be said to stand well this year. The changes that have been inevitable at the old Pencraig (recently restarted as Bettws-y-Coed), at Llanrwst, and now with the Mineral Corporation have rather a disheartening influence. We seem to have to wait much longer than was anticipated for satisfactory results from other mines. The resumption of work on a vigorous scale, too, at Coed Mawr Pool Mine seems from one complication after another to be repeatedly postponed.

The shipping of slates to the Baltic ports from Portmadoc is now ceasing for the season. Although not equal to some former years, the summer trade now closing has been a decided improvement on last year. An inland trade also has grown up for this district, and large quantities of slates are now forwarded by both the Cambrian and London and North-Western Railways. From the port of Carnarvon a better trade has been done likewise, still the trade will not be what it ought to be until the building trade of Scotland—on which to a considerable extent this port depends—recovers itself. Quarry owners are making sacrifices in order to get rid of their old stocks of small sized slates, and only yesterday a large quantity (10 by 6) was sold for 5*s*. per 1200. Some of the sett quarries near Portmadoc are doing but little, but this is hardly, I think, due to slackness of demand. The Moel-y-Gest Quarry is working vigorously, and the quarry is about to be connected with the railway by a new siding. The brick, tile, and stone trades of the Ruabon district follow the fluctuations in the building trade, and they are, therefore, at the present time not so good as they might be. The trade, too, in common bricks is hardly remunerative at present prices. Mr. Mason, of the Trevor Brickworks, has commenced the manufacture of bricks for the lining of iron furnaces, by mixing with the fire-clays of the coal measures the sandstones which lie at the base of these, and which correspond to the "gannister" beds of the North. A similar attempt was made some years ago by Mr. Edwards, of Trevor, but for some reason or other the manufacture was discontinued. The works of the new railway from Bala to Festiniog are progressing, and the end near Bala has a finished look. This line will place the Festiniog Slate quarries in connection with the Great Western Railway. They will then be connected with four railways and a shipping port.

TRADE OF THE TYNE AND WEAR.

Sept. 29.—The Coal Trade, on the whole, is more healthy, the demand for best steam coal for the Baltic and other ports is improving, and most of the works are kept fairly going. At Broomhill and other works in the northern part of the steam coal field there is a good demand for second-class steam and bunker coal, and the pits are well employed. The demand for house coal has improved a little for home consumption and coastwise, and the shipments of gas coal are large. At Blyth the exports to Cronstadt and other foreign ports is well kept up. The dredging operations for the purpose of deepening the harbour here are to be commenced at once, an understanding having been come to with the North-Eastern Railway Company, and when the harbour has been improved and railway facilities provided the shipments of steam coal from this port will be largely increased.

The Coke Trade continues good; on the whole exports are fairly kept up, and there is a large inland demand. A correct estimate can hardly be given, but it is believed that at least 11,000 tons of coke are produced in Durham daily for blast-furnaces. An increased quantity is being carried over the South Durham and Tebay line, and between Newcastle and Carlisle, for use in the Furness and West Cumberland districts. It has been the custom from the commencement of the trade to make contracts for its delivery forward for long periods, in some cases for several years, and this has, of course, given rise to much speculation, these contracts sometimes being made on terms much to the benefit of the consumer, and at other times much in favour of the producer, but this is likely to be changed. At present there are many contracts running at much higher rates than those now current, but lately some contracts have been made for long periods on the basis that the price shall rise and fall in given proportions with the rise and fall of the average price of pig-iron as declared under the sliding scales in Cleveland. This principle has been adopted by some large consumers of coke, and it is claimed for it that its tendency is to steady the trade, and to minimise the fluctuations in price. At present, so far as quantity is concerned, the coke trade is very prosperous, and the prices generally are fairly remunerative, and in some cases contracts are held which yield handsome profits. A great portion of the old ovens which were out so long in Durham have been again utilised, and new ovens have been built at many works. The London house coal trade has improved considerably lately, and prices are also better; the latest quotations for Huttons on the Thames are 17*s*. 6*d*. per ton.

The iron trade continues quiet, but there has been an increase in the shipments of iron from Middlesbrough during the past week included in the manufactured iron are large cargoes of steel rails sent to America. The total for the week was—pig-iron, 18,265 tons; finished iron, 6730 tons. Iron shipbuilding continues to improve on these rivers, many good orders have been booked lately, and in consequence marine engine builders, boiler-makers, and founders are full of orders. General engineers, locomotive makers, &c., are scarcely so busy, and there is still a lack of orders for colliery engines, boilers, &c., in some quarters, but there is certainly an improvement in these branches consequent on the increased activity in the iron and coke trades. At Middlesbrough on Tuesday there was a slight improvement in tone, No. 3 quoted 38*s*., warrants stood at 40*s*., and more enquiry for warrants. Connall's stores increase by

300 tons per day, and now hold 97,000 tons. Makers will not sell at present rates beyond the present year. Reports that the American demand will be restricted as considerable stocks are held in that country. The finished iron trade is quiet, and prices are falling: ship-plates, 6*l*. 7*s*. 6*d*.; and bars, 5*l*. 7*s*. 6*d*. The Weardale Iron Company are enlarging their works. Ironfounders have good orders for chain and pipes. The plate makers held a meeting, and decided to sell ship-plates on the basis of 6*l*. 7*s*. 6*d*. Coal and coke show very little change.

A rumour is in circulation that an influential party of gentlemen at Glasgow propose to form a company for the purpose of constructing a direct railway line between Newcastle-on-Tyne and Glasgow. The project is also likely to receive support in Newcastle, as the routes at present open between these great centres of manufacturing and mining industry are at present very circuitous, and there are also other grave objections to the present routes, the lines are in the hands of different companies, and the through traffic it is stated is often considerably obstructed. The construction of such a line would reduce the distance very materially between those great centres, and also open out a large area of land now destitute of railway accommodation. A scheme is also talked of for providing more direct communication between Newcastle and Liverpool.

A public meeting in connection with the Technical College for Newcastle-on-Tyne was held, on Friday, to promote and arrange this important institution. The Mayor (Mr. Cail) presided, and there was a numerous attendance, the various industries of the district being well represented. Dr. Rutherford read the report of the committee appointed to organise the business, which recommended that they follow the plan adopted by the City and Guilds of London Institute, and the classes which have been organised for the ensuing season are:—Alkali manufacture, fuel manufacture, glass manufacture, mechanical engineering, mine surveying, telegraphy, and iron and steel manufacture. The report was adopted, and the scheme will be carried into effect.

It is stated that the figures which will be made known at the end of the week of the iron production for the first three-quarters of the year of Cleveland and Durham will show a total of 1,800,000 tons—more than that for the whole of the past year. There will also be found to be an equally satisfactory increase in the quantity shipped out of the district, for whilst last year's shipments were under 600,000 tons in the nine months those for the nine months of this year will exceed 710,000 tons. In addition to this growth in the crude iron trade there has been an even larger increase in the exports of manufactured iron and steel, shipments of which to the United States still continue from the district.

THE SEAHAM COLLIERY EXPLOSION.—Great exertions have been made lately to get the workings in the Maudlin seam opened, but owing to very heavy falls of the roof the progress made has been extremely slow. The roof in this seam is of a soft nature, and the force of the explosion has been very great here as well as in the Hutton seam. Where the explosion originated is not as yet known, but the opinion appears to gain ground that two distinct explosions occurred, and it is evident that those explosions were of a very violent character, the destruction of the doors and everything barring its progress sufficiently attest this. On Monday four bodies were found beyond a fall which was partly cleared in the Maudlin seam. Those men were found to be Edward Hall (Stoneman), J. Lonsdale, Wm. Morris, Walter Murray; and a piece of paper from Walter Murray's report book was found pinned to Edward Hall's jacket, and upon it was written—

Sept. 8, 9, 1880.
E. Hall and J. Lonsdale died at half-past three in the morning. W. Murray and W. Morris and James Clarke visited the rest at half-past nine in the morning, and all living in the incline.

Upon the water-bottle of one of the poor fellows, Michael Smith, was written the following letter to his wife, evidently scratched with a nail—

DEAR MARGARET—There were forty of us altogether at 7 a.m. Some were singing hymns, but my thoughts were on my little Michael. I thought that he and I would meet in heaven at the same time. Oh! dear wife, God save you and the children, and pray for myself. Dear wife, farewell! My last thoughts are about you and the children. Be sure and learn the children to pray for me. Oh, what a terrible position we are in. "Little Michael" was the writer's child whom he left at home ill. The child died on the day of the explosion.

The place indicated as the incline is called the east way, and it is supposed there are 40 bodies there. It is evident that all these men escaped injury from the explosion, but could not reach the shaft, owing to the heavy falls, and they then retreated into the workings, where there was sufficient air to sustain life, but of course this air would become gradually vitiated. It would appear from the above note that the two men named died 24 hours after the explosion, and at that time all the men in the district referred to, 40 in number, were living.

On the same day an official inspection of the mine was made. Present—Mr. Willis, Mr. Bell, Mr. Atkinson, Mr. Stratton, and others. They reported all the roads near the shaft right, and that the opening of the Maudlin seam was proceeding satisfactorily. The four men named above were brought to bank, and it is hoped that the others will be recovered shortly. By Tuesday much progress had been made in clearing the falls, and a number of bodies were found and brought to bank, the total number now got being 108. It is now thought that the first explosion occurred near the shaft at or near the junction of the Hutton and Maudlin seams, as the force of the blast has been expended inwards from this point and also outwards into the shafts. There has of course been a considerable quantity of explosive gas and a plentiful supply of fresh air to produce such a violent explosion.

FOREIGN MINING AND METALLURGY.

Prices are not very clearly defined in the French department of the Haute-Marne. Rolled iron from coke-made pig has made 7*l*. 4*s*. to 7*l*. 12*s*. per ton, with a scale of 4*s*. to 8*s*. per ton between classes, according to the works and the composition of orders. Mixed iron has made 8*l*. to 8*l*. 8*s*. per ton, and No. 20 mixed machine iron 8*l*. 12*s*. to 8*l*. 16*s*. per ton. In the Meurthe-et-Moselle pig for refining is quoted nominally at 2*l*. 12*s*. per ton at the works. In the Nord prices for iron range between 6*l*. 8*s*. and 6*l*. 16*s*. per ton according to the works, according to the radius of sale, and according to the composition and importance of orders. Special rails for tramways are in some demand in France, but the offers exceeding the demand prices are still very low. The imports of iron minerals into France in the first seven months of this year show an increase of 108,819 tons, or 19 per cent., as compared with the corresponding period of 1879. The exports of iron minerals from France showed of 23,540 tons, or 58 per cent., in the first seven months of this year, as compared with the corresponding period of 1879. The exports of iron minerals from Bilbao in July amounted to 239,673 tons, of which 137,938 tons went to England, and 34,660 tons to France. The aggregate exports of iron ores from Bilbao in the first seven months of this year amounted to 1,374,925 tons. In the first seven months of this year 181,579 tons of Spanish iron minerals were imported into France.

The Belgian Iron Trade exhibits depression and stagnation. The causes of this are difficult to indicate, but they none the less control the market. The intelligence received from other countries has not been favourable; pig has appreciably fallen in Great Britain, and English pig can now be purchased at 2*l*. 7*s*. per ton delivered at Antwerp. Notwithstanding the dulness of the Belgian markets, most of the Belgian blast-furnaces have their productions engaged until January, 1881; under these circumstances their proprietors show an indisposition to accept new contracts at lower rates. Iron merchants obstinately maintain iron at 5*l*. 4*s*. per ton. All the Belgian mechanical construction establishments are well occupied with orders on account of the Belgian Government. Plates for boilers and locomotives are still selling at 8*l*. to 9*l*. 12*s*. per ton, according to numbers. The great Boom bridge has just been "launched" with complete success. The present price of red minettes in the Luxembourg basin is 1*l*. 0*s*. 10*d*. to 1*l*. 4*s*. per ton. A rather general fall has been noted in iron upon the Austrian markets. The situation has not experienced any change in Germany during the week which has just elapsed. Orders continue to arrive, but only moderately; and, speaking generally, they are far below what had been antici-

ated. It had been hoped especially that orders would have come to hand from the United States, but this hope has been disappointed.

A good demand for domestic qualities of coal has set in in Belgium, and the deliveries from the Mons and Charleroi basins have been very considerable. The sugar-making season promises well in Belgium, and it is possible that the orders for coal now given out by Belgian sugar manufacturers may not prove sufficient; in that case as a consequence of the extraordinary crop of beetroot we may possibly see some new orders, and a certain animation in the Belgian coal markets. Stocks continue to decline in the Liège group, and the demand is everywhere active. Notwithstanding this prices remain generally stationary, and do not show any upward tendency. Quotations for coke have also remained stationary. Transactions in domestic qualities of coal have become active in France; good household coal has made 2*l*. to 2*l*. 4*s*. per ton delivered, and these prices have been maintained with firmness. Complaints are made of the time which coal-boats take in making a voyage from Charleroi to Paris, and it appears that the bad organisation of the towing service is the cause of this. It is evident that the Belgian collieries must suffer considerably from such a state of things. The imports of English coal into France have, as is well known, increased very greatly of late years. In 1858 these imports amounted to 1,344,000 tons; in 1878 they had risen to 3,049,887 tons.

DIAMONDS IN INDIA.—In a paper in the forthcoming number of the "Journal of the Scientific Proceedings of the Royal Dublin Society," Mr. V. BALL, of the Geological Survey of India, gives an account of the mode of occurrence of diamonds in India and of their distribution, and adds references to the most important authorities on the subject. There are in India three extensive tracts widely separated from one another, in which the diamond has been sought for. The most southern of these has long borne a familiar name, which is, however, to a certain extent a misnomer. There are no diamond mines in Golconda. This name, originally applied to a capital town, now represented by a deserted fort in the neighbourhood of Hyderabad, seems to have been used for a whole kingdom; but the town itself was some miles distant from the nearest of the diamond mines, and it was only the mart where the precious stones were bought and sold. The second great tract occupies an immense area between the Mahanunda and the Godavari rivers; and the third great tract is situated in Bundelcund, near the capital of which, Punnah, some of the principal mines are to be found. The work of the Geological Survey has demonstrated that the diamonds occur in the Vindhyan rocks of Northern India. In the upper division of this formation there is a group of clay slate (Rewah), and in the lower a group of sandstone (Semri), in both of which diamond-bearing beds are met with. It is still very doubtful, however, if a diamond has yet been found in India in its original matrix. Mr. Ball gives an account of the chief mines, describing in detail, from personal observation, that of Sambalpur, which has now for some time ceased to be productive. The Punnah mines are still productive, yielding a mean annual produce of between 40,000*l*. and 60,000*l*. a year. Europeans have attempted diamond-mining in each of these three tracts, but in no one instance have their operations been attended with success, and yet there does not appear to be the least ground for supposing that there has been any real exhaustion of the localities where mining is possible. In diamond-mining there must necessarily be a considerable amount of individual handwork. There are immense facilities for speculation. It would almost seem that to work it profitably a system of slavery must be adopted. It is, therefore, to be distinctly understood that, except by a mere chance, diamond-mining will not prove a rapid road to fortune. Still, writes Mr. King, "for those content with a slow-paying occupation and a hard life, involving close personal supervision of the workers, it would pay, provided such persons possessed capital sufficient to last them a few years."

Meetings of Public Companies.

THE DEVALA MOYAR GOLD MINING COMPANY.

The first ordinary general meeting of shareholders was held at the Exchange Buildings, George-yard, Lombard-street, on Tuesday, Sir DAVID SALOMONS, Bart., in the chair.

The SECRETARY read the notice convening the meeting. The CHAIRMAN said the meeting was the statutory one, and, therefore, there would be no actual business to transact. He had much pleasure in informing the shareholders that the entire capital had been paid up within 7*l*. 10*s*., and the conveyance from the Moyar Company to themselves had been executed and was now on its way to India for registration there, consequently all the necessary preliminaries had been complied with. They had to thank very much Mr. Lattey for his services, and the great assistance he had rendered in carrying out those legal preliminaries, for they had to keep within the law of England and India, and also the Stock Exchange rules. They had also to thank General Light and Mr. Rhodes for the position in which they now stood, for it was to their efforts that the mining right was obtained for the Moyar Company, and then transferred to this company. He thought if the price of their stock in the market was any criterion at all they might take it that the undertaking commands public confidence, which confidence he hoped would continue. The confidence of the public was not only shown in the property which they had obtained, but also in the gentlemen whose services they had been fortunate enough to secure. Mr. Brough Smyth, who was present, and who would address the meeting after he had concluded his remarks. But before Mr. Brough Smyth was introduced to the meeting he had to ask the shareholders to listen to a few words which he believed would interest them very much. The engineer and the board were making most extensive enquiries as regarded the machinery in order that they might get the very best and most approved machinery, and thus run no risk of failure by mischance. Mr. Brough Smyth would shortly go to Australia to secure the services of a practical mining staff, and at the same time he would take the present opportunity of thoroughly sounding the market in that country with a view of disposing of certain sections of the company's property, which was better understood there than in this country, and he was in hopes of transacting some satisfactory business out there. (Hear, hear.) Mr. B. Smyth would give them during the meeting a full account of their mining property, and also the reasons which had often been enquired about why the mining industry there had ceased and gold working decreased during the last few years. Several bags of gold quartz were now on their way to England, and these would be sent to Messrs. Johnson to be assayed, with a view of confirming Mr. Brough Smyth's assay. This was to be done as Mr. Smyth's desire, and as soon as the results were known they would be published. (Hear, hear.) There were also some tons of quartz coming over, but they would not arrive in England until late—probably some time next week. By reference to the prospectus it would be seen that the company purchased the estate of the Moyar Company. Gold for some time past had been known to exist in many parts, but only in some parts it was reported to have been found. Since Mr. Brough Smyth had been prospecting on the estates he had found that the reported discoveries were not only real but important. The Rhodes reef was, perhaps, the one most exposed, and the results were highly satisfactory. The board had given the greatest attention to the way in which the reef should be worked, and they considered the best way would be to form an auxiliary company. They were, therefore, making arrangements under most favourable conditions for the carrying out of such a project, and it would, probably, meet with great success. (Hear, hear.) It had also been considered very carefully what would be the best way of managing such a concern. No doubt to make a real success of the Rhodes Reef Company it would be advisable to have Mr. Brough Smyth as the engineer, to overlook and attend to the work there; and if this were done it would be absolutely necessary that the management in both cases should be carried on in the same way. In such a case, however, there would be the original company, and, so to speak, its child, the auxiliary company, with one management, and Mr. Brough Smyth would have but one board to look to for instructions. This would do away with all possible disagreements and unpleasantness. (Hear, hear.) The meeting would receive during the proceedings a statement of probable profits which would be derived from the working of the reef. From what was already known it was expected that about 68,000*l*. a year might be reasonably taken as a minimum profit. (Cheers.) Mr. Brough Smyth would also point out to the shareholders that it was not proposed to part with the best part of the estate. (Hear, hear.) When the new project had been sufficiently matured the shareholders would again be called together to confirm the action of the directors and to sanction the scheme, which would, no doubt, meet with approval. (Cheers.) He had now to introduce to the meeting Mr. Brough Smyth, who was well known to all present as having had great experience in Australia, but perhaps he was better known as having been the one to introduce this question of obtaining gold from India by his reports to the Government of this country. (Cheers.) His integrity was also well known, and it was not, therefore, necessary for him to say one word on that point. He thought after the meeting had heard Mr. Brough Smyth they would see that he was entirely sincere in every opinion which he had expressed. After the general business for which they had been called together was over then, of course, Mr. Brough Smyth or himself would be most happy and anxious to answer any questions which might be put. The shareholders would bear in mind, no doubt, that whatever the mine was worth, or likely to be worth, it would be necessary on their part that they should exercise patience for a little time until the machinery was erected, and some results were obtained, but he could promise them in the meantime that they should be kept well informed of

what was going on, and he hoped that what was done by the board would meet with the entire approbation of the company. (Cheers.)

MR. BROUGH SMYTH: It is not necessary that I should refer at any length to the physical character of the country known as the South-East Wynaad, a portion of which is comprised in the auriferous areas owned by the Devála-Moyar Gold Mining Company. The subject has been dealt with in my official report to the Government of India. The plateau on which mining operations will be carried on has a mean height of 9000 ft., but some portions of the Devála-Moyar estates have an altitude of 4000 ft. The trend of the lands of Harewood and Kintail is eastward and south-eastward towards streams which during the greater part of the year carry a good volume of water; and the facilities for storing water are very great. Strathern and Maryland are on the western side of the dividing range, which extends from Hudiabetta north-eastwards, and here, again, there is water, and every provision of nature for the construction, at a small expense, of artificial reservoirs. As regards climate, I can only repeat that on the coffee plantations many Europeans live there in good health throughout the year. The coffee planter must face the monsoon at all times, and expose himself during the months of March, April, and May to the sun. The mine, on the other hand, is protected as well from the drenching rains of the monsoon as from the sun, and I have every confidence that quartz mining operations can be safely conducted throughout the year. You have heard, no doubt, a good deal about the want of water in some parts of the Wynaad. It has been stated that some localities are likely to feel this want. This cannot apply to the properties of the Devála-Moyar Company. On their northern boundary they have what may justly be described as a river—a perennial stream—and elsewhere numerous streams. The surface of the country exhibits a succession of hills and valleys, and it would be difficult to find anywhere in the world features which present naturally so many sites for artificial lakes and reservoirs of water. I may remind you that the wet season continues for some months, and that the rainfall, per annum, is seldom much below 200 in. Besides, there is a flow of water, not small in volume from the reefs; and you may safely assume that as regards the properties of the Devála-Moyar Company, and indeed, in the Wynaad generally, the question of water-supply will not be a serious one. The outcrops on the practical man, except for the purpose of turning the great natural advantages to account. I first visited Devála in August, 1878, and almost immediately after my arrival I took up my residence at your Harewood bungalow, on the Moyar estate; and one or other of the bungalows on the Moyar estates formed my headquarters during the period in which I was engaged in prospecting. The first tests were applied to the soils; and gold was got by washing in a tin dish at various points between the Lower Harewood bungalow on the road to Sheardale. Attention was subsequently directed to the quartz reefs and the numerous veins outcropping on the estates, and gold was got both by washing and by assay. My object, however, at that time was to make a general and not a particular examination of the country, and I need not say that no special attention was given to any one estate. I certainly did give some time to the examination of those reefs where work had been carried on by Europeans. That was my duty, and the results gave me confidence respecting the reefs more immediately in the vicinity of Devála. It will be seen from the map which I have brought with me that the outcrops of reef and the native workings are extensive within the boundaries of this company's properties. Of the outcrops on the Strathern and Maryland estates I can speak very highly. That which first engaged my attention, and which has also attracted the attention of others, is situated in the midst of native workings on the northern portion of the Strathern estate. The native workings, mostly covered with heaps of broken quartz, are about 5 or 6 acres in extent. The reef is well exposed on the summit of an escarpment falling steeply towards a large, strong, and rapid stream of water, beyond which are paddies. It is not possible at present to say what the thickness of this vein is, but it appears to be a massive reef, and it is traceable by outcrops for two miles and a quarter—that is to say if it is, as supposed, a prolongation of the reef found at the Hamsdale bungalow. But whether it is the extension of the Skull, the Hamsdale, or the Hamskull reef there can be no question, it is believed, as to the several outcrops for a distance of 60 chains towards and beyond the Strathern bungalow. The line is traceable all the way, not alone by the outcrops but by the native workings. In my official report to the Government I state that there are great facilities for mining and crushing the quartz, and that at the point here referred to operations might be undertaken with the best prospects of success. I repeat that opinion has since been to some extent modified by subsequent examination and discoveries in connection with other reefs on your estates it is perhaps still correct. The yields per ton by assay have been at the following rates:—4 dwts. 21 grs., 5 dwts. 19 grs., from merely chance pieces of quartz knocked off from the outcrop on the surface. From quartz outcropping quite near—in fact, just above the old road—the yield was at the rate of 10 dwts. 22 grs. per ton. These yields, the position of the reef, its extent longitudinally, its proximity to a strong stream of water, and the fact that the natives have mined here extensively, all serve to convince me that this is a very valuable property, and that no time should be lost in opening up the reef. Just previous to my last visit to the Devála-Moyar Company's estates Mr. Minchin, at my request, had been getting out quartz and searching for outcrops on lines indicated by my map, and in cutting into the dense jungle 28 chains west of the Maryland bungalow large caverns excavated in quartz by natives, probably some thousands of years ago, were found. I examined these as far as possible, and I had the outcrop cleared of trees and scrub for some distance. I set the Korumbers to work to break out quartz under my own eye, and visible gold was soon got. An assay gave at the rate of 14 dwts. 13 grs. per ton from stone in which the gold had been seen on washing a dish of the rubble and dirt left by the old native miners a fine show of gold was the result. At one point the reef is certainly 5 ft. in thickness, and there are numerous strong leaders and veins. The workings are on the edge of a steep slope, and there are the usual facilities for working the mine and conveying the quartz to the mills. About 24 chains south-easterly from the reef at Pothoo Cottah, which I have ventured to name Salomon's reef (for we must have names, gentlemen, to distinguish our reefs) there is a large outcrop of quartz traceable for a considerable distance. The thickness of the reef, judging from what is exposed, must be very great. Gold was got from quartz at this point, and near the road gold was washed out of the soils, and it will be well to have so important an outcrop thoroughly prospected. It is at present impossible to say whether or not this outcrop is an extension of Salomon's reef, nor is it certain as yet whether it is a prolongation of the outcrop on the southern boundary of Harewood, at the site shown on my map. I may here mention that gold has been got about 10 chains west of the Maryland bungalow. Indeed, it would not be difficult to wash out gold from the earth near the reefs on any part of these estates, and I need not say that the gold has been derived from quartz veins. Rhodes' reef—which I so named because it was through Mr. Rhodes, now a director of this company, that I was at last induced to connect myself with this undertaking. He was the first to communicate with me as one of the proprietors of the coffee estates of the Moyar Company, and it was at his urgent request and from the knowledge I had of those associated with him, that I finally consented to act as engineer for this company. Rhodes' reef outcrops at a point near the heads of streams which trend north-westerly, and the spot where it has been partially opened is 20 chains west of the district road. Here you have every facility for economic mining: you have water, an excellent site for machinery, and a good road all the way from the shipping port to the reef itself. Where exposed the reef is over 8 ft. in thickness. On the surface it is very ferruginous, and in other parts there are nests of undecomposed pyrites. I saw gold broken out of the stone on the spot, and the yields up to date have been at the following rates per ton:—

(a)—0	11	16	in defect.
(b)—4	12	5	a little fine gold visible.
(c)—4	4	1	no gold visible in the stone.
(d)—0	15	3	no gold visible.

Merely to ascertain whether or not there was gold in the pyrites, I subjected some to treatment—but none was assayed—and the result by a rough method was at the rate of 13 dwts. 2 grs. per ton. You will shortly know the results of the assays of stone from this reef as determined by practical chemists of the highest reputation in London—as I sent a large quantity of stone by the Peninsular and Oriental steamer to the company before leaving Ootacamund, with the request that it might be analysed. The samples of stone will arrive in a few days. It seems almost incredible that this property presents features which cause me to regard it as of great value. The records of the mines of Victoria, Australia, the records show that the average yield of gold from over 13,000,000 tons of quartz crushed in years past has been 11 dwts. 8 grs. per ton. It is also worthy of notice that in three years nearly 900,000 tons of quartz were crushed for a yield of only 5 dwts. 12 grs. in the same colony, and that anything over 2 dwts. per ton will, under favourable conditions, give a profit. It is also known to you that the Alpha Company working near Devála, with appliances which no words of mine can sufficiently describe, got from nearly 900 tons of quartz an average yield of 2 dwts. 1/2 grs., and the consequence, with the same machinery—under other management—was 300 tons of quartz gave 10 dwts. 12 grs. per ton. You may judge what quantity of gold was lost when I state that at the time I visited the works quicksilver and amalgam were to be got almost anywhere below the tables. Well, if 100 tons were erected at Rhodes' reef or on any other of the favourably situated reefs on your estate, and if they crushed on more than 2 1/2 tons of quartz per diem, and if the yield per ton were, say, 10 dwts., the profit per annum, as carefully as I can calculate it—and allowing nearly double the price of getting out quartz and treating it as determined by actual experience in the Wynaad, less carriage, 250 tons x 250 dms. = 62,500 tons; gold at 2s. 6d. per dwt., 108,375s.—(we are, as far as practical mining is concerned, in a new country remember)—would be 68,000s. per annum for this one reef alone. Near the summit of the high hill (forming part of the dividing range), behind the Harewood bungalow, there are native workings of some extent. These are described in my official report, and I need only add that at my last visit (in July) I found stone showing gold, samples of which will soon arrive in London. It would be easy to expose the whole of these workings; it could be done at a small cost; and then the true value of the reef and leaders could be ascertained. About 18 chains west of the Harewood bungalow, in the Kintail estate, there is a large mass of quartz exposed; and I caused an examination to be made at the time of my last visit, and quartz was taken out which on being broken and crushed showed a good sample of gold. Again, a little way from the bungalow on the main road there is quartz, and the reef is now being traced. Stone got here yielded well. There are outcrops of quartz at other points within the Harewood and Kintail areas, and all of them should be opened up. As regards Kintail I can say little. There are native workings of great extent—so much can be seen; but in order to explore this area properly it will be necessary to cut into the jungle and shale. This is a work that ought to be proceeded with at once. There are fifteen outcrops, or indications of outcrops, on these estates, as well as native workings in numerous places, as already stated. I need not enter upon the history of gold mining in the Wynaad, nor refer to the causes which led to the abandonment of the mines by the natives. The miners in past times were not permitted to mine for their own profit; they worked for the rajahs and zemindars, and were supplied scantily with food in exchange for the gold they got. Gold mining practically ceased when coffee planting began, and slavery ceased also. From the time of Nicholson's explorations in 1831-2, up to the period when the Alpha Company commenced operations (1875) little attention was given to the gold mines, although, through the exertions of my friend Sir W. Robinson (now deceased), some large quantities of gold were found. Mr. Robinson, in the Madras Presidency, and for a time Governor, through his exertions the taxation of the Murriya and the Pauty, small as it was in view of the

results by inefficient methods, was abolished, and the miners were, in a word, set free. Sir Wm. Robinson has always taken the deepest interest in the development of the mineral and other resources of South India; and the encouragement and aid afforded by him greatly helped me in my earlier labours. I need not tell you again that the soils of South-East Wynaad have been worked by natives over and over again with their imperfect appliances for thousands of years. Even now we hear of large pieces of gold having been discovered in times not far back, but, as in Australia and California, the soils—the richer soils—have been exhausted as far as it was possible to exhaust them, by the methods known to the natives. The "nuggets" were probably smelted to form ornaments for the Great Temple. All the most learned men who know India regard the Wynaad as the source whence the gold that enriched the princes in ancient times was derived; and if you could see, as I have seen, the ancient aqueducts, the walls built by the miners and the ground washed by them, you would believe, as I believe, that the learned historians and others like Mr. Eastwick are altogether right in their conjectures. When the first announcement was made by me of the discovery of rich quartz near Devála, Sir Andrew Clarke, at that time Minister of Public Works in India, and a member of the Viceroy's Supreme Council, telegraphed to me for information, and I well remember his words of caution. I am sorry I have not the telegram with me. He gave expression to the feeling of deep responsibility that rested on the Government in communicating to the public the results of my labours, and stated that the Supreme Government was fully alive to the magnitude of the influence the discoveries must have on the future of India—economically, politically, and socially—and in the most judicious manner was anxious to do all that was possible to ensure the importance of the events demanded. Sir Andrew felt that he was in a certain measure responsible for my acts, as it was through his recommendation that I went forth. Gentlemen, I was able to reply that I had used caution, and that I had the utmost confidence in the future success of well-conducted enterprises. That confidence is more than justified by recent explorations, and I congratulate the shareholders in this company on the prospects that are presented, and I congratulate all those who have the welfare of this great empire at heart, on the certain and speedy development of a new industry in that part of it which lately presented such awful misery and desolation only a failure in the food resources of a country can produce. I have myself no more than a professional and a general interest in the work initiated in the Wynaad; and as your directors, I am convinced, are determined to carry on legitimate mining operations—not "picking the eyes out" of any reef for the sake of immediate gain—as it is, I know their earnest desire to procure the very best machinery in the very best place, and to work with economy—it seems beyond doubt that success will reward this enterprise. I will read you a list of the samples which I have analysed. Rhodes' reef, no visible gold, marked NVGR, 1 bag; Rhodes' reef, pyritous stone, marked PSR, 1 bag; reef behind bungalow, showing gold, marked B, 11 bags; reef behind bungalow, no visible gold, marked NVGB, 1 bag; old native workings, Pothoo Cottah, visible gold, marked VGONN, 5 bags; old native workings, Pothoo Cottah, visible gold, marked VGONW, 5 bags; old native workings, Pothoo Cottah, no visible gold, marked VGONW, 1 bag; reef overlooking Sheardale, Harewood West, pyritous quartz, marked BBSNG, 1 bag; leader stone, north of Strathern, Wright's land, broken by Mr. Minchin, marked LBSNW, 1 bag; Kintail and Balcas, 1 bag; reef behind road, 1 bag. There will ultimately be a large field open to the gold miner in India. There is no reason why "claims" similar in extent to those which give profitable returns in Australia should not be taken up by Australians and Americans—men who know what gold mining really is. The Supreme Government, acting on the advice and authority of Sir Andrew Clarke, have, with the sanction of the Secretary of State, provided that no direct fiscal restrictions or exactions are to follow on the creation of this industry. The utmost encouragement will be given to the miner by no means less than that which is given to the miner in Australia, and there is no reason why we should not have hundreds of miners at work occupying claims of (say) 5, 10, and 20 acres. As in Australia, there will be mills working for the public, where quartz can be crushed and treated at a price per ton, and when results shall have been obtained such as to satisfy you, gentlemen, and the public gold mining will be commenced in earnest.

SIR WILLIAM ROBINSON: The kind words of the chairman are scarcely correct, because as far as I am concerned I had no wish to appear before you, but I may say a few words for my friend Mr. Brough Smyth. I am not connected with any company, either as a shareholder or otherwise at the present moment; therefore I am out of order in appearing before you. ("No, no.") I have now for nearly one-third of a century been connected with the district in which your operations are being carried on. I am an official of old standing, and am now retired, but I have been connected with the Malabar and Wynaad districts in an official capacity since 1846. I joined it almost as a boy, and have passed the greater part of my services there, and I am most deeply interested in everything which will advance the prosperity and raise the condition of the people amongst whom the happiest days of my official life have been spent, people's sympathy with whom I shall carry to the end of my days. (Cheers.) I am proud to say, and I am glad to remember it, that I had some little to do in securing the services of Mr. Brough Smyth, and the reason I looked upon him as a public servant, and as one of the servants who worked under myself as a member of the Government. A great part of his information is really of a general character, and it must affect the whole question of other associations who, no doubt, are listening and waiting for his words on this occasion, and it is one of the reasons why I appear to support his work. (Loud Cheers.) It was really a public work, and I am sure that the Government did not see their way to secure Mr. Brough Smyth as a public servant for good, and I congratulate you very cordially upon having secured him for this company. (Cheers.) I have been very much amongst the natives of India. Of course, this is a new industry, and of course, there is a good deal of property—I am not speaking of this company, but of Wynaad generally—where the titles are not complete, but I believe there will be difficulty in completing them. The whole Government industry has been carried on through the support of the natives, and they have freely given their land for this purpose, and I am sure there will be no difficulty in English industry carrying out good feeling with it. (Cheers.)

MR. WILLIAM ABBOTT said that if doubt had existed in the mind of any man in the City of London as to the extraordinary interest which the discovery of gold in India had excited the large and representative assembly to-day would be a final and conclusive answer. (Hear, hear.) He spoke with some sense of responsibility, having been the first to introduce Indian gold mines to the public, and he did so on the faith of this report of Mr. Brough Smyth to the Government, in whose employ he then was. He had faith in that report, and now, having heard the elaborate exposition of what Mr. Brough Smyth had seen, he had greater faith than ever. There was no attempt on his part to catch applause; everything was done in the style in which the gentlemen were making a report to the official department of which he was one time a member. There was one important point with respect to these discoveries—commercial men in the City of London could hardly have recognised what a revolution this discovery of gold would produce in the trade of this country. Fancy for one moment the Indian Government being able to remit the dividends on Indian railways in gold, and thus avoid the enormous loss which they now suffered through the adverse exchange. If the discoveries initiated by Mr. Brough Smyth should bring the rupee up to one-tenth of a pound, that would stimulate business, and would be a boon to the country; therefore, considering this question entirely from speculation in the shares of this company, he believed firmly in it. He was a very large shareholder, and he believed they could not possibly be more fortunate than in having secured the services of Mr. Brough Smyth. He was extremely pleased with his address to-day, because it showed that that gentleman had confidence in all which he had stated, and he believed that when the property came to be developed the shareholders would not be disappointed. (Cheers.) They might not have the pleasure of seeing Mr. Smyth again, and therefore, he would say two or three questions, the replies to which would be given by the company. In the first place he would ask whether, after a closer examination of the gold fields, their resources and extent confirmed the anticipation that their production would, when developed by proper machinery, rival that of California and Australia? Secondly, he would ask whether when quartz crushing commenced in Australia the ascertained facts justified as much confidence in the future of those countries as the facts ascertained in India justified the expectation of an equal future in India? Lastly, whether, taken as a whole, the conditions for getting gold economically were as great in India as in Australia. (Hear, hear.) In conclusion, Mr. Abbott said in parting from you, sir, I am happy to say that, as representing a large amount of the capital which has been embarked in the Indian gold mines, that you have inspired me as well as I am sure every member of this important meeting with a large amount of confidence in your ability. (Applause.)

MR. DAVIDSON asked Mr. Brough Smyth whether he considered the properties in the neighbourhood were equal in their prospects to the Devála Moyar? **MR. SCHOFIELD** asked Mr. Smyth upon what data he founded his opinion that 2 dwts. per ton would pay the cost of mining, milling, and carriage? He also asked when the machinery would be at work?

MR. WALKER asked whether the company had sold any portion of its property to the Peninsular Company?—**THE CHAIRMAN:** No.

MR. WALKER: Is there any connection between the two companies?—**THE CHAIRMAN:** None, whatever.

MR. BURTON said that it might interest shareholders to know, that as a large employer of labour in Wynaad, he could state that they could get as much mining labour in Wynaad as they required at 1s. per day, whereas in California labour was 5s. per day.

MR. BROUGH SMYTH then rose to answer the questions which had been put by Mr. Abbott and other gentlemen. He said,—the first question by Mr. Abbott was "whether your closer examination of the Indian gold fields, their resources and extent, confirms the expectation that its production would, when developed by the employment of proper machinery, rival in amount that of California and Australia." I need not read from you, sir, I am happy to say that, as representing a large amount of the capital which has been embarked in the Indian gold mines, that you have inspired me as well as I am sure every member of this important meeting with a large amount of confidence in your ability. (Applause.)

there—I am afraid to mention the Indian names, but Sir William Robinson knows what I mean—all the country south of the Gorty has gold fields, auriferous reefs. Mr. Abbott's second question was, "whether, when quartz crushing commenced in Australia, the ascertained facts justified as much confidence in the future of that country as the facts ascertained by you in India justify an expectation of a product equal to that of Australia." In answering that question I would point out that all the richest surface quartz in the Wynaad had already been taken away by the native miners. They have mined the surface reefs, and gone in many places to as great a depth as 100 ft., not that if you instituted a comparison between what we can find in the Wynaad now and what was found in Australia before it was developed, the comparison would be manifestly unfair, but if you institute a comparison now between what the Wynaad is, and what the former has revealed in prospecting, then I say I have the very greatest confidence in its future results. The last question is, "whether, in Australia?" I do not pretend to know the whole of Australia. I know one colony well—Victoria—and there is only one quarter (Beachworth) where the facilities for mining are as great as those presented in the Wynaad. I made a note here on that point:—Cost of getting out the quartz in the Wynaad. I made a district of Australia, where they mine by adits 2s. 2d. per ton, whereas in other places, such as Sandhurst and Ballarat, where they have to mine in other shafts, the cost ranges from 12s. 10d. to 27s. 4d. You can mine in the Wynaad by adits nearly everywhere in the estate, except one small portion. As regards the question about the value of the neighbouring properties I can only say that Mr. Chairman and gentlemen, that I have given my opinion rather elaborately in the report presented to Government, and I have not made any further exploration of them since. I have further explored the Devála-Moyar, and that is why I am able to speak to you with such confidence about it now. Touching like 2 dwts. per ton would cover expenses, or give a profit, I may state that during the early part of 1883 over 3 dwts. 6 grs.; October, 1883, to March, 1884, 2 dwts. 6 grs.; and 24,447 tons taken at different dates between May, 1864, 1 dwts. 16 grs. per ton. At Ballarat the Black Hill crushed nearly 300,000 tons, averaged 2 dwts. 23 grs.; the Majesta Company, 36,000 tons, 4 dwts. 8 grs.; 13 dwts.; 14 dwts.; 9 dwts.; 5 dwts.; 4 dwts.; 3 dwts. (an enormous quantity at 3 dwts.), and 16 dwts., but a very small quantity on this last standard, 85,000 tons produced 2 dwts. 17 grs., and 12,459 tons 2 dwts. 4 grs. Perhaps the statement referring to the yield is not put by Mr. Schofield as clearly as it should be. I said that anything over 2 dwts. per ton will, under favourable conditions and good economic management, give a profit, and we find it is so. A question was also asked as to the sort of machinery that will be used. I am not prepared to answer it yet, and in fact I have been but a short time in London. I shall make a most careful investigation, and then give my opinion to the directors. As regards the number of stamps to be erected, there might at first be a small number, but ultimately at least one hundred.

MR. PARSONS: How many stamps do you reckon to yield a profit of 50,000? **MR. BROUGH SMYTH:** 100 stamps, crushing 2 1/2 tons per diem. I may state that I hope within 9 or 10 months of this time to have the machinery up, by which time also you will ascertain the results of our operations on a large scale from one of the reefs embraced in the Devála-Moyar Company's estate. (Hear, hear.)

SOUTH CARADON MINING COMPANY.

At a meeting of shareholders on Tuesday (Mr. R. KITTO in the chair) the accounts for the three months ending July, showed a loss of 896l. 13s. 7d., reducing the credit balance to 1657l. 11s. 5d. Mr. J. G. Dymond having resigned the proprietorship, thanks were voted to him, and Mr. W. H. Rule was appointed his successor at 2s. 6d. per month. Capt. J. H. Holman reported that the mine continues to yield large quantities of good quality ore; but in consequence of the very serious depression in the price of copper they have failed to pay the cost of the quarter. The large quantity sent to the market, if sold at the rate of the previous three months, would have met the deficiency, and enabled them to have paid a dividend. They are sinking two of the engine shafts, and hope by another meeting to intersect the lodes at these levels, which, if productive, and they have every reason to believe they will be, judging from the levels above) will very materially enhance the present and future value of the mine.

PEN-YR-ORSEDD LEAD MINING COMPANY.

The second ordinary general meeting of this company was held at the offices, Great St. Helen's, on Wednesday.

MR. EDWARD J. BARTLETT in the chair.

MR. JOSEPH WOOD (the secretary) read the notice convening the meeting; and the report of the manager was read as follows:—

Sept. 27.—We beg to submit to you our first annual report of the above mine, showing the work accomplished during the year and our present position and prospects.—**Surface Work:** On surface we have erected an engine-house, mine cabin, store room, and office. For the whim we have substituted one of Robey's winding-engines. We have also put up a new pithead, and have introduced other modern appliances, so as to afford the greatest facility for bringing up shaft to surface. Indeed, our winding arrangements are now second to none in the district.—**Shaft:** (Hughes') We have put into a thorough state of repair, the upper part being thoroughly retimbered with pitch pine, and ventilation the mine we have set up a patent fan, which is worked by means of a strap on the fly-wheel of the engine, and have laid down pipe (4-inch zinc) to our lowest workings.—**Sundry Work:** Besides the above work, we have sunk a reservoir about 180 yards from the shaft, and have syphoned the water from there to engine-house. The pithead has been raised, and a tram laid along our north cut.

Underground Operations: At a depth of 122 yards a cross-cut has been driven north for the purpose of intersecting the middle and Hendre lodes, the latter we cut about 20 yards from the shaft, its matrix being composed of carbonate of lime and limestone. The exploration of this lode was left for the present, in order that we might lose no time in getting at the main lode further north, the one which proved so rich in the western workings, where good ore has been laid. Had the lode taken the course of its average line the intersection would have taken place ere this, and instead of being able only to write you of cross-cutting operations we should in all probability have had the more agreeable duty of putting you of the number of tons of ore obtained from them and the present value of the ends. As it is we have passed through highly mineralised ground which augurs well for its richness when cut, and there can be no doubt that the lode has taken at this point a more northerly bearing. We may now deliver up to cut into it. The total length of this cross-cut is about 44 yards. It is a fact universally accepted by all practical miners that lodes prove more productive in certain limestone beds than in others—i.e., they are more congenial to the production of ore, and these beds are generally designated the bearing measures. Now to get to the best bearing measure in this district we had to cut the shaft, and this we have done to the depth of nearly 200 yards. Having come to the desired depth we have ceased sinking, and are now preparing to throw out a short cross to intersect our south lode.

Our present position is this—in our 122 yards cross-cut we are daily expecting to intersect the proved rich lode to our north, and taking the most unfavourable view of the position of the lode we cannot more than 4 or 5 yards from it. In the bottom of the shaft we are preparing to throw out a cross-cut to intersect the south lode in some of the best bearing formations, so that in all probability in a few weeks we shall be raising lead from these points. I have no words to describe a dividend concerning the mine. When we take into consideration the extent of the set, the number and character of the lodes traversing it, its geological position (the latter being identical with that of the neighbouring Great Rhosmor Mine), or the fact, by no means unimportant one, that no pumping machinery will be required, it will be seen that the shareholders have every reason for congratulating themselves upon the acquisition of such a valuable mining set.—**R. PRINCE, G. BELLS.**

THE CHAIRMAN: In moving that the directors' report and balance sheet which you have taken as read should be adopted I will make a few remarks, and answer any questions that may be subsequently put to me, although I am sorry to say that we have such a small attendance to-day, notwithstanding the earnest desire of the directors that the shareholders would be well represented. I think, as far as the balance sheet is concerned, the figures are very clear, and, on the whole, denote a satisfactory position for the company to be in, for although we are not yet able to record as a fact that we have made sales of lead ore at profitable prices still you will notice that our liabilities only amount to a sum of 50l. 5s. 9d., while on the other side we have cash at bankers and due amounting to 146l. 11s. 5d. With regard to the machinery, that is alluded to in the report just read, and I think it must strike you that a sum of 210l. is extremely small for the purchase of an engine that will be capable of doing all the winding and pumping in connection with Hughes' shaft, and can only say that if other companies had attempted to secure an engine of the same power as we now have at Pen-Yr-Osredd it would likely have necessitated a much larger expenditure. We, however, have a good fortune to possess on the board in the person of our esteemed colleague, Mr. Gamble, a gentleman who is well acquainted with machinery, and who has considerable influence with Messrs. Robey and Co. Thanks, therefore, to the kindly offices of Mr. Gamble we were able to effect a great saving by purchasing the machinery from them. (Hear, hear.) There is one additional point referred to in the directors' report which I must allude to, and that is the regulation of mines and dispensation with the kibble arrangement for winding, and substituted guides and conductors, as used in nearly all our collieries. It is not in every shaft that this arrangement can be made. Hughes' shaft is, however, perpendicular; and, therefore, it is very easy for us to put in conductors. Frequently shafts are sunk 20, 30, 40 yards deep, and then when the lode is met it is sunk on the under side of the kibble, which prevents any such arrangement as we have been able to adopt at Pen-Yr-Osredd, and which in the near future will turn out to be a very great advantage, for, in addition to less wear and tear, by the use of the guides and the cage we shall be able to transport to surface a very much larger quantity of stuff than we could do with the kibble arrangement. We had with content with the old arrangement in use when the company took possession of the set. Now, gentlemen, reverting once more to the balance sheet you will find that for the whole of this property we have simply a sum of 9000l., and the greater part of that is represented by shares. I think it is a very favourable feature, and one to which you may fairly be referred with pardonable pride by the management. I may tell you frankly that after this company had been formed such was the high opinion entertained of its prospects that if we had not concluded our arrangements when we did it would have been a much larger sum, we are led to believe, might have been obtained for the set. The owners had only sought to reach it at a later period. With regard to the mine and its underground workings, notwithstanding the explanation which has been given in the report just read, it may be natural that you should desire some further information. You are aware, or a reference to the main shaft of the company will remind you, that it was stated that so soon as the machinery erected thereon, it would only be necessary to drive the cross-cut under the middle of the 4 or 5 yards before the lode would be intersected. I have no doubt that the very fact that we have not reported the intersection of the Hendre lode must be a great disappointment to some of the shareholders. Well, gentlemen, the fact is, after driving not 4 or 5 ft., but something like 8 or 10 yards, we intersected the lode which was not the Hendre, but which is referred to in the report as the

95 east and west. From the discovery in the 80, without being at all sanguine as to how long it is likely to last, I should say there ought to be produced something like 15000. worth of produce. (Hear, hear.) Thus you see how valuable these runs of ore become, and immediately the 85, which is now within 2 or 3 yards of this particular run, interests me if you have a section of ground 75 yards thick which ought to keep us well supplied with lead to pay our costs and give us a profit, without reference to any further discoveries that we may make. This Holway lode (the same as runs through the Great Holway Mine) has proved enormously rich for something like 2 or 3 miles in extent. The nearer it approaches the coal measures the more the ore has been found in a consolidated state. It is easily worked, the produce is rich for silver, and there are other facilities. Suffice it to say that not only does the Holway lode as found in our property bear out the expectations entertained of it, but that everything in regard to the future of West Holway is full of promise. I state in the report that the mine has been proved rich at the 110 yard level, and I have explained previously how the ore was obtained there by driving from the whim-shaft, and how then it became necessary to sink the new shaft in order to extricate it. Now, before we can get at the 110 we have a sinking of 15 yards to do. That, however, will not be unprofitable work. At present the bottom of the shaft is in a fair course of ore, and mixed with the lead there is blende, and with the blende there is spar, so that we shall not have the shaft sinking 15 yards a dead weight upon our capital, although even with the resources at our disposal we should have ample to do all we require. It is most desirable to sink as fast as we can to the 110, for then we shall have the 80 to produce ore as well as the 95 and the 110, and very soon, as the 110 levels are driven sufficiently far to get to the discovery that we know exists, you will be able to have such a large produce from these three levels as will give you surprisingly satisfactory dividends, looking at the small capital embarked. With regard to the levels going westward, every-thing points to the fact that we shall be able to commence with the 110 level last month we shall now be in the market with regular parcels, and I hope that before long we shall be able to send to market at least 25 to 30 tons of lead, and as we have no water, our surface expenses will be small. After providing for all liabilities we have a credit balance of £1597. 8s. 6d., which is ample (without coming to the shareholders for fresh capital) for not only carrying out all the great points that we may contemplate, but which will always leave us a balance, so as to be able to turn from time to time other operations that may seem advisable. What has been done from time to time has been done in a judicious manner, upon our local manager, Capt. Rowland, and I think that in all the departments the shareholders have every reason to be satisfied with the management. The amount of work accomplished in relation to the money expended, and the present results justify the directors in congratulating the shareholders upon the prospects of the undertaking. I know that when the shareholders have read my speech the most important question of all will occur to them—when may we expect the welcome dividend warrants? To that question I have a plain answer, so soon as the 90th level is reached, and the source of water is cut off, and then, after, to open up an extensive section of ground for stoping. That will put into the market a large quantity of lead, and then it will be only the question of a short time before the directors will be able to declare an interim dividend, and be in a position I hope to continue them to the satisfaction of all concerned. (Hear, hear.) The object of the directors has been to lay the mine open not with the view of spasmodic profits, which, like the early dew, appears for a little while and then vanishes away, but with the view of making it one of permanent prosperity, a credit to the manager, and a source of constant success to the fortunate possessor of its shares. (Hear, hear.) I think that great deal of our present success is due to the energy and skill of our manager, who has great faith in the undertaking, and naturally wishes his name to be identified with its success. I can heartily endorse what he says in the concluding paragraph of his report that he believes our settl will turn out a lasting and exceedingly rich mine. I think we have demonstrated that by actual discoveries. It remains for you to have the confidence in the ultimate success of the mine as the board now have. We have plenty of capital, and in the element of cost, success, and if you rest your confidence in us you will find we think that your investment in the company's shares will yield you a substantial profit upon the market if you desire to sell, or a permanent source of income if you adopt the wiser course of continuing your connection with the company. It only remains for me, gentlemen, to conclude as I began, by moving the adoption of the report. (Cheers.)

A SHAREHOLDER: Have you got all the machinery required?—THE CHAIRMAN: For the present, yes. It is a very important thing for the Great Holway shareholders to move westward, and in the element of cost, success, and if you rest your confidence in us you will find we think that your investment in the company's shares will yield you a substantial profit upon the market if you desire to sell, or a permanent source of income if you adopt the wiser course of continuing your connection with the company. It only remains for me, gentlemen, to conclude as I began, by moving the adoption of the report. (Cheers.)

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PARIS EXHIBITION, 1878.



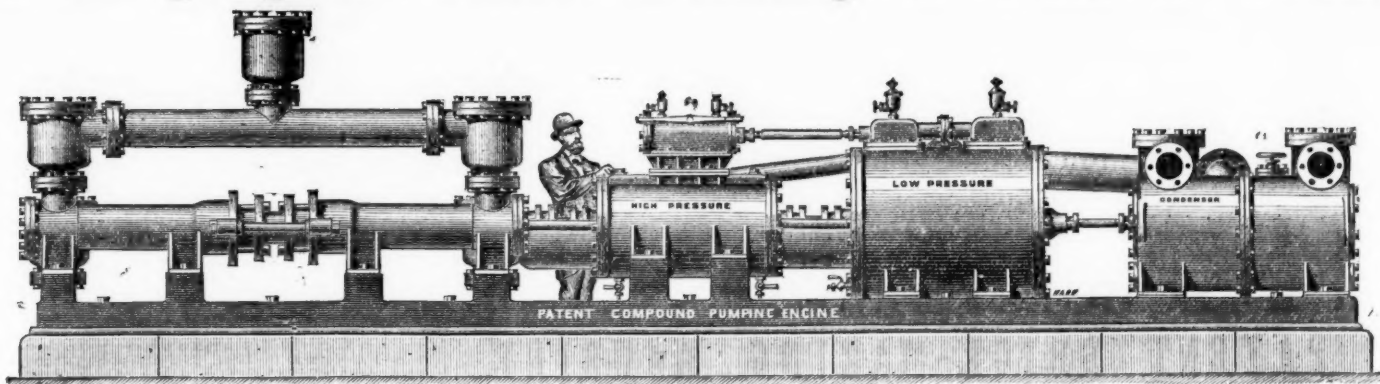
**GOLD AND SILVER MEDALS AWARDED for
Steam-Engines & Boilers, also the Special Steam Pump,
and Compound Pumping Engine.**

TANGYE BROTHERS AND HOLMAN,

CORNWALL HOUSE, 35, QUEEN VICTORIA STREET, LONDON, E.C.,
AND BIRMINGHAM, (TANGYE BROTHERS), CORNWALL WORKS, SOHO.

TANGYE'S DIRECT-ACTING COMPOUND PUMPING ENGINE,

For use in Mines, Water Works, Sewage Works,
And all purposes where Economy of Fuel is essential.



TANGYE'S DIRECT-ACTING COMPOUND PUMPING ENGINE, WITH AIR-PUMP CONDENSER.

**TANGYE'S COMPOUND PUMPING ENGINE COMBINES SIMPLICITY, CERTAINTY OF ACTION, GREAT ECONOMY
IN WORKING, COMPACTNESS, AND MODERATE FIRST COST.**

This Engine will be found the most simple and economical appliance for Mine Draining, Town Water Supply, and General Purposes of Pumping ever introduced, and as regards Mine Draining, the first cost is very moderate compared with the method of raising water from great depths by a series of 40 or 50 fm. lifts. No costly engine-houses or massive foundations, no repetition of plunger lifts, ponderous connecting rods, or complication of pitwork, are required, while they allow a clear shaft for hauling purposes. In this Engine the economical advantages resulting from the expansion and condensation of steam are very simply and effectively obtained. The steam after leaving the high-pressure cylinder is received into and expanded in the low-pressure cylinder, and is thus used twice over before being exhausted into the condenser or atmosphere.

The following first-class Testimonials will bear evidence as to the efficiency and economy of the Engine:—

TESTIMONIALS OF TANGYE'S COMPOUND PUMPING ENGINE.

21' Newcastle and Gateshead Water Company, Newcastle-on-Tyne, Oct. 20, 1879.
36" x 10" x 48" COMPOUND CONDENSING STEAM PUMPING ENGINE.

Messrs. Tangye Brothers.

GENTLEMEN,—In reply to your enquiry as to the efficiency of the two pairs of Compound Condensing Engines recently erected by you for this company at our Gateshead Pumping Station, I have great pleasure in informing you that they have far surpassed my expectations, being capable of pumping 50 per cent. more water than the quantity contracted for; and by a series of experiments I find they work as economically as any other engine of the compound type, and will compare favourably with any other class of pumping engine. By the simplicity of their arrangement and superior workmanship they require very little attendance and repairs, and the pumps are quite noiseless. A short time ago I had them tried upon air by suddenly shutting off the column, and found they did not run away, thus showing the perfect controlling or governing power of the Floyd's Improved Steam-moved Reversing Valve. I will thank you to forward the other two pairs you have in hand for our Benwell Pumping Station.

(Signed)

Yours respectfully,
JOHN R. FORSTER, Engineer.

The Chesterfield and Boythorpe Colliery Company (Limited),
Registered Office, Boythorpe, near Chesterfield, Oct. 1, 1879.

21"

36" x 12" x 48" DOUBLE RAM COMPOUND CONDENSING STEAM PUMPING ENGINES.

Messrs. Tangye Brothers.

Supplied in January, 1878.

GENTLEMEN,—Referring to the above, which we have now had working continuously night and day for the last 12 months, we are glad to say that it is giving us every satisfaction. It is fixed about 400 feet below the surface, the steam being taken down to it at pressure of 45 lbs. per square inch. We can work the pump without any difficulty at 28 strokes per minute—224 ft. piston speed. The pumping power is enormous. The vacuum in the condenser being from 11½ to 13 lbs. The pump is easily started, and works well and regularly. The amount of steam taken being much less than we anticipated. We consider the economy in working very satisfactory indeed. The desire for power and economy at the present day will certainly bring this pump into great requisition.

Yours truly,

(Signed)

M. STRAW, Manager.

SIZES AND PARTICULARS.

	8	8	8	10	10	10	10	12	12	12	12	14	14	14	14
Diameter of High-pressure Cylinder.....In.	8	8	8	10	10	10	10	12	12	12	12	14	14	14	14
Ditto of Low-pressure Cylinder.....In.	14	14	14	18	18	18	18	21	21	21	21	24	24	24	24
Ditto of Water Cylinder.....In.	4	5	6	5	6	7	8	6	7	8	10	7	8	10	12
Length of stroke.....In.	24	24	24	24	24	24	24	24	24	24	24	36	36	36	36
Gallons per hour approximate.....	3900	6100	8800	6100	8800	12,000	15,650	8,800	12,000	15,650	24,450	12,000	15,650	24,450	35,225
Height in feet water can be raised with 40 lbs. pressure per square inch in } Non-condensing...	360	330	160	360	250	184	140	360	264	202	130	360	275	175	122
Ditto ditto ditto—with Holman's Condenser...	480	307	213	480	333	245	187	480	352	269	173	480	367	234	162
Ditto ditto ditto—with Air-pump Condenser...	600	384	267	600	417	306	335	600	440	337	216	600	459	203	203

CONTINUED.

	16	16	16	16	18	18	18	21	21	21	24	24	24	30	30
Diameter of High-pressure Cylinder.....In.	16	16	16	16	18	18	18	21	21	21	24	24	24	30	30
Ditto of Low-pressure Cylinder.....In.	28	28	28	28	32	32	32	36	36	36	42	42	42	52	52
Ditto of Water Cylinder.....In.	8	10	12	14	8	10	12	14	10	12	14	10	12	14	14
Length of stroke.....In.	36	36	36	36	48	48	48	48	48	48	48	48	48	48	48
Gallons per hour approximate.....	15,650	24,450	35,225	47,950	13,650	24,450	35,225	47,950	24,450	35,225	47,950	24,450	35,225	47,050	35,225
Height in feet water can be raised with 40 lbs. pressure per square inch in } Non-condensing...	360	230	160	118	456	292	202	149	397	276	202	518	360	264	562
Ditto ditto ditto—with Holman's Condenser...	480	307	213	154	603	389	269	198	528	363	269	691	480	352	750
Ditto ditto ditto—with Air-pump Condenser...	600	384	267	191	750	486	337	248	660	450	337	864	600	440	937

PRICES GIVEN ON RECEIPT OF REQUIREMENTS.

Any number of these Engines can be placed side by side, to work in conjunction or separately as desired, thereby multiplying the work of one Pump to any extent.

NORTHERN DEPOT:—TANGYE BROTHERS, ST. NICHOLAS BUILDINGS, NEWCASTLE-ON-TYNE.

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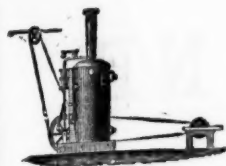
PARIS, 1875.



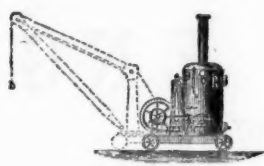
PRICE LISTS AND
PARTICULARS
ON APPLICATION.

CHAPLIN'S PATENT PORTABLE STEAM ENGINES AND BOILERS.

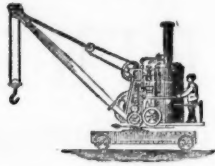
ALWAYS IN STOCK OR IN PROGRESS.



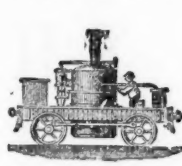
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From 1 to 30 horse-power.
No building required.



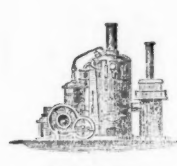
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1 to 30 horse-power.
With or without Jib.



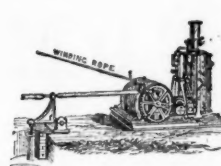
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15 cwt. to 20 tons.
For Wharf or Rail.



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9 to 27 horse-power.
For Steep Inclines and Quick Curves.



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For Winding, Cooking, and Distilling.
Sanctioned by H.M. Government.



PUMPING AND
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6 to 30 horse-power.

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Steam and Hand Derrick and Overhead Travelling Cranes.

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PATENTEES AND SOLE MANUFACTURERS:

ALEX. CHAPLIN AND CO., CRANSTONHILL ENGINE WORKS, GLASGOW.

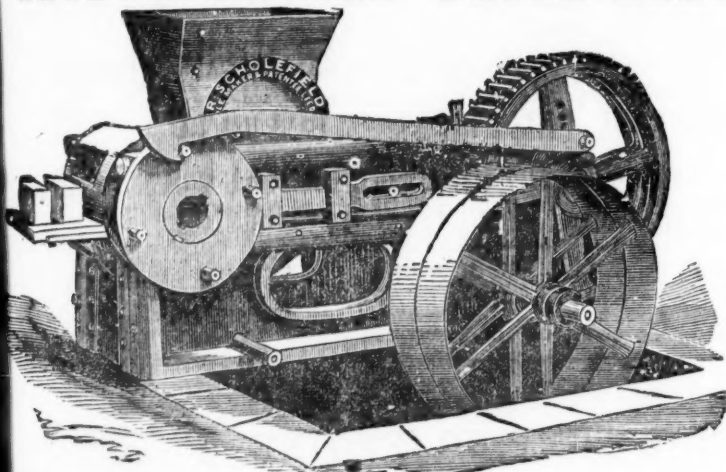
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R. S. begs to call the attention of all Colliery Owners in particular to his PATENT SEMI-DRY BRICK MACHINE, and the economical method of making bricks by his patent machinery from the refuse that is taken from the pits during the process of coal-getting, which, instead of storing at the pit's mouth (and making acres of valuable land useless) is at once made into bricks at a very small cost, by R. S.'s Patent Brick-making Machinery. If the material is got from the pit hill, the following is about the cost of



production, and the hands required to make 10,000 pressed bricks per day:—

2 men digging, each 4s. per day	...	80	8	0
1 man grinding, 4s. 6d. per day	...	0	4	6
1 boy taking off bricks from machine, and placing them in barrow ready for the kiln, 2s. per day	...	0	2	0
1 boy greasing, 1s. 6d. per day	...	0	1	6
1 engine-man, 6s. per day	...	0	5	0
1 man wheeling bricks from machine to kiln, 4s. per day	...	0	4	0

Total cost of making 10,000 pressed bricks ... 21 5 0, or 2s. 6d. per 1000.

(SETTING AND BURNING SAME PRICE AS HAND-MADE BRICKS.)

Where the material can be used as it comes from the pit, the cost will be reduced in digging. As the above Machinery is particularly adapted for the using up of shale, bind, &c., it will be to the advantage of all Colliery Owners to adopt the use of the Brick-making Machinery.

THE MACHINES CAN BE SEEN IN OPERATION AT THE WORKS OF THE SOLE MAKER AND PATENTEE DAILY.
SCHOLEFIELD'S ENGINEERING & PATENT BRICK MACHINE WORKS
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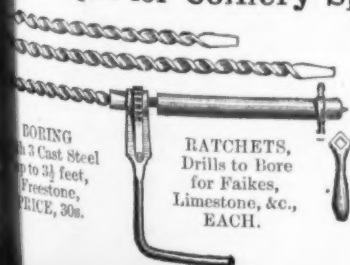
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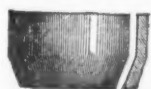
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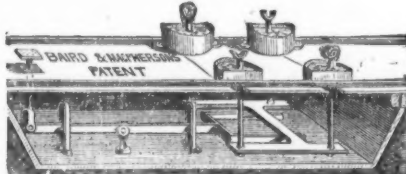


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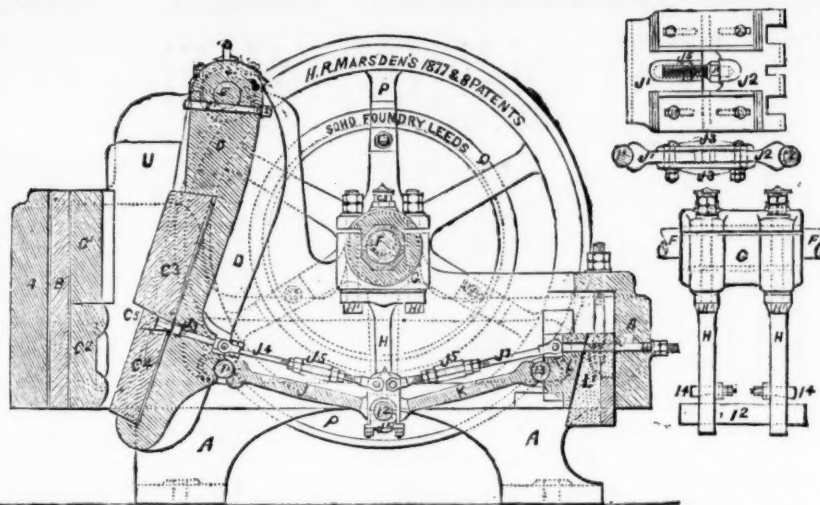
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60

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St. John del Rey Mining Company (Limited).
A SAVING OF FIFTY-FIVE HANDS BY THE USE OF
ONE MEDIUM-SIZED MACHINE.

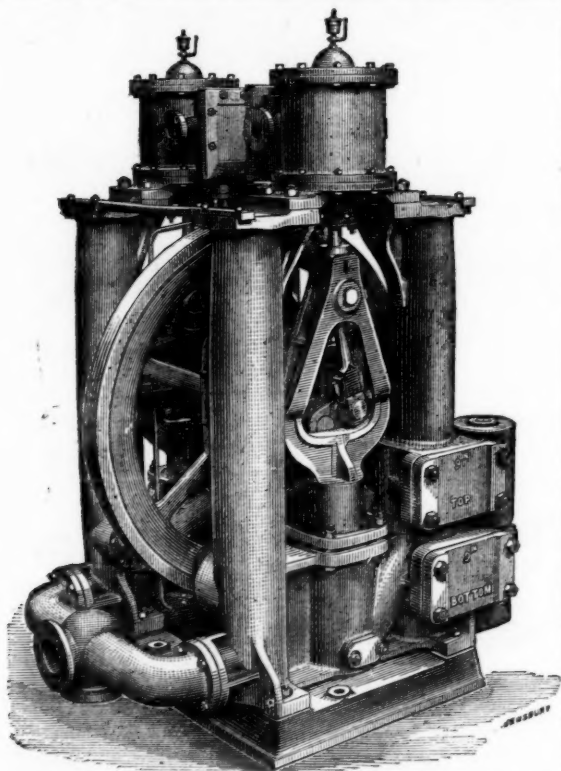
BLAKE'S STONE BREAKER.—Statement made by the
Managing Director of the St. John del Rey Mining Company,
Mr. John Hockin, with regard to six months' practical
working of Blake's Stone Breaker, affording facility for
judging of the relative economy of machine and hand
labour in this kind of work, and also of the cost of getting
the Stone Breaker to work in difficult places. The price
paid to Mr. Marsden for the machine referred to by Mr.
Hockin was £180, and adding to this the cost of engine,
carriage, and fixing, the aggregate cost to the company
of the Breaker in working order was £500. By this outlay
the company is enabled to dispense with the labour of 55
people, the value of which is £500 per annum. The cost
of working the machine could not be more than the wages
of about five men (the machine requires but one man to
feed it, so that the rest would be for engineer, fuel, oil,
&c.), and allowing for interest on outlay and for renewal
when necessary, the saving must be enormous.—Mining
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The Machine can be seen at work daily at the Brickworks of the Patentees,
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